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CHILDREN'S USE AND PERCEPTIONS OF SPACE IN A DAY CARE PLAYROOM

University — Université

UNIVERSITY OF ALBERTA

Degree for which thesis was presented — Grade pour lequel cette thèse fut présentée

M. Ed.

Year this degree conferred — Année d'obtention de ce grade

1979

Name of Supervisor — Nom du directeur de thèse

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Children's Use and Perceptions of Space in a Day Care Playroom

by

© Carole Audrey Massing

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF Master of Education

Elementary Education

EDMONTON, ALBERTA

Fall, 1979

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled Children's Use and Perceptions of Space in a Day Care Playroom submitted by Carole Audrey Massing in partial fulfilment of the requirements for the degree of Master of Education.

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Abstract

This study investigated the spatial interactions of one group of preschool children in a day care center by examining their observed use of the space in their playroom and their perceptions of that space. The study was exploratory in nature.

The aspects of the children's behaviors which were investigated had to do with the nature of the time spent in settings, the relevance of activity to setting and the associations in a variety of settings within the playroom. A measure of these factors was obtained through use of a room scan technique. Interview procedures, which employed a model of the playroom and pictures of the playroom settings, were conducted to find out about children's perceptions.

The findings of the study, although specific to the particular day care room and group of children at the time they were studied, served to generate useful information for further research and tentative implications for day care practice.

Acknowledgements

Many people have helped with this study, and to them I am exceedingly grateful:

To my thesis advisor, Sheila Campbell, who provided me with my introduction to Early Childhood Education and whose guidance and help has continued through the years.

To Dr. Susan Therrien and Dr. Len Stewin, members of my thesis committee, for their helpful suggestions and their interest in the study.

To Mrs. Janice McBeath and Mr. David Gilbert for their consultation on the study.

To the staff and children of the center in which the study was conducted, for their cooperation, patience and interest.

To the staff of DERS, for guiding me through the computer analysis and the intricacies of TEXTFORM.

To my parents, Lois and Archie Anderson, and to my sister, Bonnie, for providing a caring environment for our children in busy times. And to my parents, as well, for teaching me that education is important.

In this, as in other areas of my life, my first thanks is to my friend and husband, Duane, who cares about what happens to people. Thanks, too, to our children, Christine and Nevin, whose enthusiastic approach to life helps us both to remember what education is about.

May you all share in my pleasure in the completion of this thesis, and know that you have played an important part

in its production.

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I. Chapter One

Introduction to the Study

In Canada, in 1978, 67,887 children were registered in full-time group day care programs (National Day Care Information Center, 1978.). The majority of these children were in the two to six year age range. Preschool aged children who attend full time group day care programs spend most of their waking hours, during an important formative period in their lives, in the day care environment. The experiences that these children have in day care must be considered as factors in their development.

The spatial characteristics of a preschool environment appear to be significantly related to the experiences of the children inhabiting the environment. Research shows that children respond to the spatial characteristics of their environment. Spatial variables such as density (Loo, 1972; McGrew, 1972; Peck and Goldman, 1978), complexity (Scholtz & Ellis, 1975; Johnson, 1935) and organization (Rogers, 1976) have been found to influence the behaviors of preschool children in group settings. Prescott, Jones and Kritchevsky (1972) combined variables such as organization, complexity, variety and amount to do per child in a set of criteria used to judge the "quality of space" in preschool settings. This rating of spatial quality was reported to be related to children's scores on interest and involvement. Differential use of space within groups of children has been noted. A 1977 study by Harper and Sanders found that preschool boys

differed from preschool girls in their use of available outdoor play space.

There is some indication that spatially-related behaviors have important implications for the development of personal autonomy and self-esteem (Wolfe, 1978; Westin, 1967). The concept of privacy is of importance in this regard and will be discussed at length in Chapter II.

The probable significance of spatial characteristics for children in group preschool programs implies the necessity for personnel involved with such programs to consider interactions with spatial factors when they are making decisions about the structuring of environments for the children in their care.

Guidelines for such decision-making appear, however, to be lacking. Concern has been expressed regarding the general lack of research in day care (Saucier, 1978) and the need to translate research findings into operational design principles which could guide day care personnel in setting up environments for children (Fein & Clarke-Stewart, 1973).

This study was designed to learn about how preschool children in a group day care setting have interactions with the spatial characteristics of their environment. The research was intended to be exploratory in nature, hopefully providing indications for further study which might, in turn, contribute to the development of needed guidelines for the organization of day care environments. The approach taken differs from that of the studies noted above in that

it describes both the children's use of space and their perceptions of space. It is hoped that findings arising from the synthesis of these two types of data will offer useful indications for further research.

A. The Problem

The problem dealt with in this study may be seen as having three aspects:

1. the gathering of information about the use of space by children in a day care playroom, as indicated by their presence in settings, their solitary and shared use of settings, and the nature of their behavior in settings,
2. the gathering of information about the perceptions of children in a day care playroom about spatial characteristics of their room, as indicated by their preference for day care settings, for solitary or shared use of settings and for kinds of behaviors in settings, and
3. the integration of this information in such a way as to build a picture of the human-spatial interactions occurring in the day care playroom.

The research addressed specific activities occurring in the settings and interpersonal characteristics associated with setting use.

B. Definitions

For the purposes of this study, the following definitions were used:

Environment: the total configuration of stimuli available to an individual for a given situation and time.

Free play: the type of activity occurring when a child is permitted to choose, from a range of activities, the one in which he will engage.

Room scan: a process wherein every setting in the day care playroom is systematically checked and the presence and activities of children in the settings noted on a grid sheet.

Setting: an area of the day care room which can be distinguished from other areas by the materials associated with it and the principle focus of the activities carried on in it. There may be distinct physical boundaries separating it from other parts of the room.

Setting specific activity: a pattern of free play behavior which is implied by the materials available in a setting.

Simultaneous setting use: a situation occurring when two individuals are observed to occupy the same setting during the same room scan.

Solitary behavior: refers to a pattern of activity in which a child is at least one meter distant from any other person, is not engaged in conversation with any other

person and is engaged in a free play activity different from that of anyone else.

Transition behavior: the type of activity occurring when a child is moving from one part of the room to another. In the room scan, children are coded as being in transition in a setting if, at the time of the scan, they are in motion in the setting with the apparent intention of passing on to another setting.

Watching behavior: refers to the activity of a child who, during a free play period, is physically stationary, not engaged in conversation with any other person and appears to be observing an ongoing activity.

C. Research Questions

The research questions are presented in three parts: questions concerning children's observed use of space; questions concerning children's perceptions of space; and questions relating the children's use of space to their perceptions of space.

Questions Concerning Children's Observed Use of Space

1. a. What proportion of the total scans for which each child was present in the day care playroom did the child spend in each setting?

   b. What differences, if any, are observed between the use of settings by children grouped by sex or by age?

2. a. What proportion of the total scans for which each

child was present was setting specific activity observed?

b. What differences, if any, are observed between the setting specific behaviors exhibited by children grouped by sex or age?

3. a. What proportion of the total scans for which each child was present was solitary behavior observed?

b. What differences, if any, are observed between the solitary behaviors for children grouped by sex or age?

4. What proportion of the total scans for which each child was present was each child observed to be occupying a setting simultaneously with each other child?

Questions Concerning Children's Perceptions of Space

5. How frequently was each of the day care room settings named as a favorite or second-favorite place to be by:

a. individual children

b. the oldest, middle and youngest group of children

c. the group of boys and the group of girls?

6. How frequently was a setting-specific activity named as the preferred activity for the setting named as a favorite or second-favorite place to be by:

a. individual children

b. the oldest, middle and youngest group of children

c. the group of boys and the group of girls?

Questions Relating Children's Use of Space to Their Perceptions of Space

7. How frequently was the setting named as a favorite or

second favorite also one which was observed to be used either proportionately more than any other setting or proportionately more than all but one other setting by:

a. individual children

b. the oldest, middle and youngest group of children

c. the group of boys and the group of girls?

8. How frequently was a child who was named by another child as a preferred companion in a favorite setting observed to be present in that setting simultaneously with that child, for:

a. individual children

b. the oldest, middle and youngest group of children

c. the group of boys and the group of girls?

9. What kinds of criteria are used, and with what frequency, to distinguish same and different properties of settings, by

a. individual children

b. the oldest, middle and youngest group of children

c. the group of boys and the group of girls?

D. Assumptions and Limitations

In this study it was assumed that the room scan technique provided an accurate picture of children's movements and use of space. It was also assumed that the interview technique provided information which accurately represented children's perceptions and constructs about the actual setting.

The accuracy of the data depended upon the level of

inter-rater reliability attained for the room scan technique and upon the extent to which the children recognized the model and photographs, related to them as representations of the actual setting and were able to articulate their reasons.

Because the children and the setting can not be assumed to be representative of children in day care settings generally, findings cannot be assumed to be generalizable to other groups of children and day care settings.

E. Summary

In Canada, large numbers of children, the majority in the three to five year age range, are registered in full time group day care programs. Because these children spend much of their time in the day care setting, their experiences in that environment are important. Research indicates that spatial characteristics of preschool settings are significant factors with regard to the experiences of the children in that environment. Decision-making in day care should therefore take into account spatial considerations, and guidelines are needed with regard to use of space in day care environments.

This study was exploratory in nature. Data concerning the use of space by children in a day care playroom and data regarding the perceptions of children about space were compared in an attempt to generate information indicating possible areas for further study. Research questions were

developed in such a way as to facilitate the comparison. The definitions used for the purposes of the study and the assumptions and limitations implicit in the approach have also been discussed in Chapter I.

In Chapter II, the theoretical and methodological background to the study will be developed. The design of the study is discussed in Chapter III. Chapter IV presents the results of the data analysis and Chapter V deals with conclusions and implications arising from the findings.

II. Chapter Two

Background to the Study

The discussion in Chapter II is divided into two parts, the first relating to the theoretical background and the second to the background to the research methodology. In Part One, theoretical positions with regard to the relationship of man and the environment are reviewed and a focus for the study established within that context. This orientation is then extended through concepts relating to man's spatial relations. In Part Two of the chapter, studies in which the room scan technique was employed to map the movements of children in group pre-school settings are described. The argument for the use of a model to facilitate the spatial orientation of young children with regard to a large scale environment is developed and Kelly's construct theory is reviewed for its implications for learning about how children perceive the spatial aspects of their environment.

A. Part One: Theoretical Background

There are three major theoretical positions with regard to the relationship between man and the environment. The first approach, in which environment is viewed as a construction of man, reflects rationalist and idealist philosophies which hold that environmentally-related concepts derive their meaning from the definition given to them by the individual. In the second position, all of man's behaviors are seen as being determined ultimately by the

environment. This approach develops from a realist-empiricist philosophy and is reflected in the ecological perspective called "situationalism" (Overton and Reese, 1977). The third theoretical position is sometimes termed "interactionism" because it looks at the individual's behaviors in relation to the environmental conditions which influence, and are influenced by, behaviors. Representative of this approach are Piaget's theoretical formulations that behavior and thought structures are constantly changing as a consequence of the processes of accommodation and assimilation of mental structures resulting from an individual's encounters with the environment (Sells, 1963). This position may be viewed as a synthesis of the other two approaches.

Within the interactionalist position, Lee (1976) describes the sequential and interdependent nature of the human-environmental relationship as a process wherein environmental stimuli are processed through a structure combining aspects of genetically predetermined dispositions, present moods and past experiences. The resulting unique perception, accompanied and partially determined by feelings and emotions, may then be expressed as behavior. Both perceptions and behavior further contribute to the store of organized experiences, thus perpetuating the cycle. In the design of research, a choice is made regarding the point in the cycle which will be monitored. One possibility is the measurement of the behavior as it occurs. Another involves

studying the unique ways in which aspects of the environment are construed by the individual. Lee describes this as a "package" approach, studying how an individual is programmed by his past experiences to perceive and act toward a part of his environment. He emphasizes the importance of realizing the interdependence of the processes, pointing out that observations at more than one point in the cycle are valuable as a check on reliability.

The design used in this study involved monitoring interactions between children and the spatial characteristics of their environment from the two approaches mentioned above, first studying the behaviors of the children in relation to spatial characteristics, and then attempting to determine individual perceptions of children in regard to these characteristics.

Man-Environment Interrelationships

Explorations of the interrelationship between man and environment have been systematized as environmental psychology or ecological psychology (Barker, 1968; Lee, 1976; Ittelson, Proshansky and Rivlin, 1970) but implications extend into many disciplinary areas. Much of the research in environmental psychology has evolved from questions concerning the design of environments for human habitation, particularly in settings where the achievement of certain defined behavioral outcomes is seen as important. Environments which have been studied include hospitals (Ittelson, Proshansky and Rivlin, 1970; Osmond, 1957 ;

Sommer, 1969), schools (Lee, 1976; Sommer, 1969), prisons (Glaser, 1970) and neighborhoods (Fried and Gleicher, 1970). Researchers involved in this area of study appear to view the gathering of knowledge and behaviors associated with environmental variables as a point of departure for the construction of environments which will maximize the potential for human development across a range of human differences.

Assumptions about Man-Environment Relations

Studies of the man-environment relationship appear to be based on certain assumptions concerning the nature of the interactions which occur. Proshansky, Ittelson and Rivlin outline a set of such assumptions in their 1967 research paper. The assumptions most relevant to this study have been modified by the researcher to incorporate the views of major theorists in the field and, as such, provide a framework for the development of the study. The assumptions have been divided into two categories, those related to the interactional aspect of the environmental-behavioral relationship and those pertaining to the individual's perception of the environment. This categorization is seen as roughly reflecting the development of this research according to the perspective derived from Lee (1976), where the study of observed behavior and of the perceptions of individuals are seen as intervention points into a cycle.

Assumptions Related to Environmental-Behavioral Interactions

1. Environment impinges upon the persons within it.

It is assumed that individuals are affected by the environmental stimuli available to them at any given point in time. Mischel's (1973) paper argues that the variance of individual behavior from one situation to another must be considered as evidence of this effect of environment upon individual behavior. An example of this influence is provided by Osmond's (1957) studies of behavior in psychiatric hospitals. On the basis of his observations, Osmond identified "sociofugal" and "sociopetal" arrangements of space, the sociofugal arrangements tending to keep people apart and discourage interaction and the sociopetal arrangements tending to draw them together, encouraging interaction.

2. Settings coerce similar setting-specific behaviors from the persons inhabiting them.

It is assumed that individuals entering a setting will be influenced by the setting such that the behaviors they exhibit will show certain similarities across the range of individuals. (For example, persons entering a church will exhibit a different set of behaviors than will persons entering a church or going to a friend's home for a party.) A basis for this assumption is found in Barker's (1963) concept of the "standing pattern of behavior", a recurring pattern of activity that take place in a particular locale and which occurs regardless of the individual involved.

3. Changes in behavior patterns within a physical setting can be induced by changing the setting.

Because settings are seen as affecting the behaviors of individuals, changes in settings are assumed to elicit changes in behavior. This phenomena has been studied within group pre-school settings, where increased density, as measured by the ratio of the number of children to the amount of space, has been found to elicit behaviors such as withdrawal or avoidance (Loo, 1972; McGrew, 1970) or aggression (Hutt and Vaizey, 1966).

4. There is a dynamic interaction between persons and the environment.

Although effects of environment upon behavior are assumed, the idiosyncratic characteristics which each individual brings to a setting are also influential. Lee's (1976) concept of human-environmental interaction as a cyclical process has been discussed previously. Willems (1978) sees the interaction in terms of a systems relationship where changes to any part will affect the other parts and change the whole. An implication of this dynamic interrelationship is that any description is only temporary.

5. Individual behavior varies across time and setting.

In the context of the dynamic interaction occurring between persons and the environment, the individual may be seen as having some relatively stable characteristics and others which show a great deal of variability from one time to another and with various situational components (Mischel, 1969). Implications of this assumption for the study of behavior are that the most useful representations of

behavior will be found in the setting most like the setting of concern and that observations of behavior should be conducted over a period of time long enough for behavioral patterns to become evident.

Assumptions Related to the Individual's Perception of the Environment

1. Each person constructs his/her own perception of the environment.

It is assumed that individuals have idiosyncratic characteristics which affect the way in which they view their environment. Lee (1976) describes these characteristics as including past experiences, moods, feelings and emotions as well as certain genetically-based dispositions. The dynamic interaction of such individual characteristics with environmental stimuli produces perceptions unique to the individual. According to Kelly's (1955) theory of personal constructs, the constructs of an individual serve as a guide in his perceptions of events, with the total system of a person's constructs comprising his personality. Tolman (1948) also built upon the premise of individual unique perceptions when he coined the term "cognitive map" to refer to the idiosyncratic ways in which individuals organize their perceptions about the spatial characteristics of their environment.

2. Individuals in the same culture and society tend to have similar perceptions of environment which differ from those of individuals in other cultures.

Among the characteristics of individuals which are factors in perception are those experiences which they have had as a result of their particular situation and role in relation to their society and culture. The role of cultural factors in the use and perception of environment is illustrated in Hall's (1966) extensive studies of personal spacing norms in various cultures. Hall concluded, on the basis of his work, that norms of personal spacing varied considerably from culture to culture. Similarly, study of the interpersonal spacing behaviors of children (Melson & Hulls, 1975) indicated that cultural differences determine variances of personal spacing among children. Studies such as these indicate that cultural influences could be among the factors to be considered in studying the interactions of children with space, if they were of different cultures.

Man and the Spatial Aspects of Environment

Assumptions regarding the man-environment interrelationship are applicable to the study of man's interaction with the environmental component of space. This area of study demonstrates, as well, the complex and dynamic system of interactions outlined in Lee's schema. Reflections of this are seen in various delineations of components of the man-space relationship. For example, Robert Beck (1970) describes the relationship of man and the spatial component of his environment in terms of three "kinds of space". The first, objective space, is space as it is measured by universal standards. The second, ego space, is the

individual's perception of objective space. Imminent space, the third type, is inner, subjective space, including the spatial styles and orientations of the individual and the ingrained cultural norms relating to space. In this study, measures of the observed use of space reflect Beck's concept of objective space. The measures of perception of space relate to aspects of imminent and ego space.

A similar type of distinction is made by Wolfe (1978), who, in her discussion of privacy, mentions the normative and phenomenological aspects of the man-environmental interaction.

An awareness of different ways of viewing space is essential to the comprehension of the interrelationships between man and the spatial components of his environment. The following discussion describes concepts in the field of proxemics as reflecting aspects of both objective space, or space as it may be measured by universal standards, and what might be termed as a subjective or phenomenological view of space, hinging upon the perceptions of the individual.

Proxemics

The term "proxemics" was used by Hall (1966) to describe the area of study dealing with man's spatial relations. Associated with proxemics are certain key concepts including personal space, territoriality, crowding and privacy. This section defines the four concepts as they are used in environmental psychology and relates them to research pertaining to young children. The concept of

privacy is developed at length, with privacy seen as involving the extent to which the individual controls his interactions with, or gives information about himself to, other persons. In the context of controlling interaction with others, privacy may be viewed as closely related to, or even encompassing, the concepts of personal space, territoriality and crowding. This relationship will be discussed in the section on privacy.

Personal Space

Personal space refers to "an area with invisible boundaries surrounding a person's body into which intruders may not come" (Sommer, 1969). Hall's studies show that distancing behaviors are normative to groups within a culture and that they serve both cultural and functional purposes. He has observed that the following factors influence personal space norms and behaviors in particular situations:

1. the characterisitcs of the physical environment
2. the characteristics of the individual
3. the characteristics of the task or relationship between individuals
4. the charcteristics of the other individual.

In situations where personal space is invaded, as in crowded elevators, persons tend to show withdrawal or avoidance behaviors which may serve to maintain the space symbolically (Sommer, 1969). These may include avoidance of eye contact, "hunching up" or similar behaviors. Gesture,

posture and the choice of a location that conveys a clear meaning to others are all methods used to defend the invisible boundaries of one's personal space (Sommer, 1969).

Research with preschool children has measured both the objective and subjective aspects related to personal space. Studies of use of space have found that older preschoolers tend to maintain greater interpersonal distances than younger children and that boys and girls show different personal spacing behaviors (Lomranz, 1975; Melson and Hulls, 1975). Melson and Hulls (1975) studied perceptions of preschoolers concerning personal space and found that children from three to five years of age strongly associated positive feelings with close interpersonal distances and negative feelings with large ones.

Territoriality

The concept of "territory" involves a definite part of the physical environment about which the individual shows some possessiveness. The phenomenon of territoriality was first described in animal studies but has since been accepted and studied as a characteristic of human behavior. Human territories may be relatively permanent (a house, a country) or fleeting (a seat in a restaurant). Defense of territories hinges upon the use of visible markers and boundaries (Sommer, 1969) and violations may produce an aggressive response.

The use of personal territories by three and four year olds entering a nursery school was investigated by Peters

and Bentzen (1971). They noted that children spent 35% of their time in 10% of the available space. The space occupied by each child was different, with little overlap. While they were in their "territory", the space most frequently used by them, the four year olds were more active in their exchanges with other children, were more accepting of other children and were more confident in their exchanges with their teacher. These findings seem to indicate that children may use space in an effort to control their environment.

Crowding

It has been noted previously that studies of the behavior of children under different density conditions show that in settings where density is greater, children may exhibit withdrawal or avoidance behaviors (Loo, 1972; McGrew, 1970) or aggression (Hutt and Vaizey, 1966). Distinctions between density and crowding involve a distinction between an objective measurement of space (density) and the characteristics of space as they are experienced by the individual (crowding). Thus a person may experience a condition of greater density as measured by population per square meter but not feel crowded. Similarily, he may occupy the same area under two sets of circumstances (for example, with a person he likes and a person he doesn't like) and feel crowded in one case and not in another.

Privacy

The preceeding discussion of the concepts of

territoriality, crowding and personal space has shown that, for each concept, there are elements relating to both the objective and the phenomenological aspects of space. The concept of privacy will also be discussed from these two perspectives. The objective aspect of privacy involves a physical separation from other persons. This separation could involve factors such as distance from other persons, lack of communication with other persons, or an activity different from that of other persons. The phenomenological aspect of privacy refers to a separation that exists in the mind of the individual. These two aspects are apparent in Westin's (1967) definition of privacy:

> Privacy is the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others. Viewed in terms of the relation of the individual to social participation, privacy is the voluntary and temporary withdrawal of a person from the general society through physical or psychological means (p. 7).

In addition to pointing out the objective and phenomenological aspects of the privacy issue, Westin's definition introduces two important characteristics of privacy--the fact that it stands in opposition to societal structures and the fact that it is voluntary.

The individual-societal conflict which is inherent in the concept of privacy sees the need of the individual to

develop as an autonomous being balanced against the need for the perpetuation of societal norms through conformity and involvement. The issue is complicated by the individual's need to be a participant in society, if he is to meet his physical and psychological requirements.

> Westin (1967) sees the individual as:
> continually engaged in a personal adjustment process in which he balances the desire for privacy with the desire for disclosure and communication of himself to others, in light of the environmental conditions and social norms set by the society in which he lives (p. 7).

On the other hand, privacy needs of individuals and groups are felt to be present in every society and influence the development of social norms protecting privacy at the individual, family and larger community levels. Thus cultural norms and conditions in society are factors with regard to what does and does not constitute privacy in a given situation. Further, they must be considered in terms of their interdependency with a range of factors pertaining to a particular individual such as life-style characteristics, past experiences, emotions and inclinations.

Westin's (1967) definition of privacy as a voluntary withdrawal from society implies the existence of a conscious choice in a privacy situation. The nature of this choice becomes apparent in Wolfe's (1978) conception of privacy as

dependent upon the existence of others (including self-as-other, objects and physical stimuli) and the possibility of a relationship with them. Privacy, therefore, involves the existence of a possible relationship, appreciation of the situation as actually or potentially involving privacy, and a conscious choice regarding the parameters of the relationship. Wolfe describes the two elements involved in the acting out of a relationship as follows:

> Interaction management: referring to a choice of the parameters of interaction with specified others, and
>
> Information management: relating to the individual's desire to manage past and present information about him/herself and attempts to gauge his/her behavior in terms of future and present consequences (p. 178).

In Wolfe's (1978) view, territorial behavior is, in fact, a defense of privacy. Similarly, the maintenance of personal space and reactions to crowding may be seen in terms of the protection of privacy.

Wolfe (1978) discusses privacy from a developmental perspective. Her views form a basis for the following discussion of privacy issues as related to children. Wolfe notes that concepts and patterns of privacy change as an individual progresses through the life cycle. Factors interacting to produce change include the experiences,

feelings, roles and activities of the individual as well as the demands and circumstances of society at the given point in time.

Developmental theorists see the growth of a sense of self as an important task of childhood (Erikson, 1963). The separation of self from other environmental components is considered as beginning at birth and progressing by stages from that point (Piaget and Inhelder, 1969; Simmel, 1971). In our society, goals for children include the development of independence and autonomy within the constraints of the societal structure. The attainment of these goals may be facilitated through the provision of appropriate childhood experiences.

Conscious choice is important to the realization of privacy. For young children, however, opportunities for choice are limited. There are physical constraints resulting from the dependence of the child upon adult care and psychological constraints, including those resulting from the young child's view of authority as omnipresent (Piaget, 1966). In the latter context, some attention has been given to the child's first lie as an indication of the beginning of separation of self. The child's lie shows that he realizes that information is not known unless it is revealed by him, marking his first attempt at information management (Tausk, 1933). As the child grows, adult surveillance lessens, giving the child an opportunity to practise the skills of managing information and interaction. In peer

relationships, the child is able to interact with others who are on a relatively equal power base, giving him wider scope for choice regarding the information and interactions he will share with others. At the same time, institutionalized group experiences, such as school, may limit choice by the imposition of group norms for behavior. Experiences with privacy, as observed and practised by children through information and interaction management, may be seen as contributing to self-esteem built upon the successful use of choice and, at the same time, provide for learning about the range and limits involved in the exercise of individual autonomy in society.

In an extensive study, Wolfe and Laufer (1975) explored the nature of children's concepts of privacy. Responses from 900 children, ranging in age from 4 to 17 years, indicated that children's concepts of privacy change with age, becoming more complex and showing a gradual increase in autonomy/choice related elements. This change was seen as reflecting the increasing availability of opportunities for choice as the child matures. Despite certain developmental trends which became apparent in the children's definitions of privacy, Wolfe and Laufer noted that the definitions developed along a wide range of themes. The life experiences of individual children were felt to be a significant factor in determining the way in which the child defined privacy.

On the basis of her studies with children aged 4 to 17 years, Wolfe (1978) concludes that:

> children know what privacy is, it is meaningful in their lives, and the elements of their abstract conceptualizations seem to come from concrete experience of various types of situations (p. 196).

This discussion suggests that privacy may have particular significance within the context of group child rearing environments such as day care. The provision of opportunities to practice the skills of information and interaction management would seem to be of importance to the personal development of children and would be an important consideration in the structuring of child experiences.

The concepts of personal space, territoriality, crowding and privacy appear to provide a useful framework from which to approach the study of children and space. Research has included both the objective and the subjective aspects of this relationship.

Studies of Children's Play

Studies of child play in preschool group environments have tended to focus upon the objective aspects of children's interactions with space, measuring the impact of play settings upon children's behaviors. Studies relating to the use of play settings, play activities and the social aspects of the play of young children are described below. Parten (1932) viewed play as progressing, with age, from solitary to more cooperative forms of play. Parten defined a child who is engaged in solitary play as:

> a child who played with toys different from those of children within speaking distance of himself, and one who centered his interest upon his own play, making no effort to get close to, or speak to, other children (p. 249).

It is interesting to note that in Parten's definition of solitary play, seen by her as the least mature form of play, there are aspects which might indicate that a child is exercising control over his interactions and the provision of information about himself. The ability to manage interaction and information is seen by Wolfe (1978) as essential to the realization of privacy and, as such, may be indicative of a level of maturity not evidenced in more cooperative forms of play. Moore, Evertsen and Brophy (1974) question the validity of Parten's view of solitary play as the least mature form of play on a basis similar to this. Rubin, Maoni and Hornung (1976) build upon this argument, pointing out that children who exhibit solitary play behaviors may be doing so from a desire to "get away from it all" (p. 418) and suggest that parallel play may, in fact, be a less mature form of play because it may suggest a desire to play with others but an inability to do so successfully.

Findings of differences for age and sex in the use of settings in preschool environments include those of Berk (1973) who found, in her study of 3 to 5 year olds, that older children spent more time in block, dramatic play, arts

and craft, eating and washing activities and that boys spent more time than girls in block play. Shure (1963) also found a higher use of blocks by boys than by girls, as well as a high overall use of the block area. The size of areas was noted in Shure's study, with the block area being the most used and largest, and the book area being smallest and least used. Other researchers note high individual variances among children in their use of settings. Featherstone (1975) attributes individual differences in setting use to the degree of adult direction and structure inherent in the setting, interacting with the cultural background of the child.

With regard to the activities of preschool children in group environments, Berk (1976) noted a high level of transition behavior as well as a high degree of active participation by children. Shure (1963) noted that relevant activity was much more frequent than irrelevant activity or lack of activity. Findings concerning the social behaviors of children in play settings include those of Shure (1963), who noted that the doll corner and block area elicited a high proportion of complex social interaction. Age differences in the level of social interaction were noted by Reuter and Yunik (1973) who found that social interaction increased between the ages of three and five years. There is evidence of a wide range in individual behavior with regard to social contacts (Loomis, 1931).

It would appear that, in studying freeplay in a

preschool setting, one might expect to find differences related to variables such as age and sex, as well as considerable individual variance among children.

Summary: The Theoretical Focus

Three possible views of the relationship between man and the environment were outlined. The approach adopted for the study represented a synthesis of these views, where man-environment interactions are viewed as a complex system of interrelationships and the perspectives of the study are seen as two intervention points into the system, hopefully providing more information than it is possible to derive when there is only one intervention point. In tracing the two perspectives through assumptions about man-environment relations and concepts relating to man's spatial functioning, it was found that they were distinguishable, in some form, through all the levels of interaction.

Research relating to children's interactions with space was noted. Certain concepts basic to proxemics, namely, territoriality, crowding, personal space and privacy, were reviewed. A conception of privacy was adopted which, in relating privacy to issues of personal autonomy, involved the inclusion of aspects of territoriality, crowding and personal space in the privacy concept. Because of the developmental significance of the privacy concept, privacy issues were seen as possibly having particular significance with regard to the experiences of children in the day care environment, where opportunities for privacy may be limited

by the need to provide for a large group of children.

Studies of children's play were reviewed. Research in this area has tended to be objective in nature, measuring the effects of play settings upon the behaviors of children. Variations in use of play settings, activities of children and social behaviors of children have been linked, by researchers, to variables such as age and sex. Variations among individual children have also been noted.

B. Part Two: Background to the Methodology

This part of the chapter deals with the theory underlying the research methodology employed in this study. Previous uses of the room scan technique for the purposes of studying movements in preschool group settings are described. Theory regarding the spatial representations of young children is presented, as this theory formed the basis for the decision to use a model of the room in interviewing the children. Finally, there is a description of the theory underlying the adaptation of tasks formulated by Kelly (1955) and used in the research interviews in an attempt to determine the constructs of the children with regard to the settings in their playroom.

Room Scan Techniques

P. L. McGrew (1970) and P.L. and W.C. McGrew (1972) developed a room scan technique to study the movements and interactions of children in a nursery school setting. The McGrews conducted studies of children's spacing behaviors by

using carpet tape to mark the floor of the nursery room into squares of approximately 2.2 by 2.2 meters, then recording the positions of every child in the room on a corresponding grid sheet at approximately two minute intervals. Proximity measures were obtained by using circles to indicate children who were within one meter of each other and using arrows as indicators to show when children were touching. In the McGrew studies, the equipment in the nursery room was arranged so that each square contained some equipment but there was no use of specific activity settings. Observer reliability does not appear to have been calculated for this technique.

In his 1975 study of a preschool setting, Tyler used a similar procedure but conducted observations systematically by setting, rather than by square. The observer scanned the room, setting by setting, marking the number of children present and the sex and interaction of each, on a corresponding room map. Measurements of observer agreement are not mentioned with regard to this study.

The room scan technique appears to have been used successfully in preschool settings as a method of recording the movements and activities of a group of children, although lack of evidence regarding observer agreement precludes determination of the reliability of the methodology.

Facilitating the Spatial Representations of Young Children

The term "cognitive map" was conceived by Tolman (1948)

to describe the way in which animals and humans organize their knowledge about the spatial characteristics of an environment. Research concerning the spatial representations of children suggests that children acquire their perceptions of space through their active involvement with the environment (Piaget and Inhelder, 1967). The manner in which young children organize their spatial representations appears to follow from their tendency to perceive ego-centrically, relating characteristics of their environment to their own position in it. Thus they may be able to construct a linear system of spatial representation, designed along routes and using landmarks, but unable to conceive of the total gestalt of a large scale space (Piaget, Inhelder and Szeminska, 1960; Hazen, Lockman and Pick, 1978). Kosslyn, Pick and Fariello (1974) suggested that the resulting spatial representations may take the form of "poorly integrated conglomerates of smaller representation". Pick (1976) proposed that, in small scale spaces, where perception involves a single act, knowledge is acquired at a sensorimotor level but that in larger environments, where parts must be perceived in successive acts, a much more complex process, involving symbolic representation, storage and integration, is involved.

Downs and Stea (1973) developed a view of spatial conceptualizations as dynamic four-dimensional representations of reality or "thought-up" models. They maintained that, in children, cognitive mapping ability

appears to preceed extensive first-hand experience with the larger environment. This ability is acquired through multi-sensory experience with parts of the larger environment and with surrogates for the large-scale environments, as occurs in toy play. These experiences are more accessible to the child than actual experiences with the total larger environment because the child must move within a restricted range in an adult-sized world. Young children are therefore capable of working more easily with small-scale representations of larger space than with the actual space. Support for this theory is derived from extensive cross-cultural studies of nearly 500 children which showed that children as young as three years of age were able to interpret micro-features on aerial photographs (Downs and Stea, 1973). A study by Acredolo (1977) offers further support by demonstrating that the use of a model of a large scale space in a spatial orientation task with three, four and five year olds facilitated the correct responses of the three and four year olds.

Siegal and Schadler (1975), investigated the ability of kindergarten children to construct, from memory, a model of their classroom. This is a task of considerable complexity in that it involves the integration of knowledge of a large scale environment to a level facilitating recall. It was found that the children were able, with a high degree of accuracy (a maximum of one error per child), to identify model items representing forty pieces of furniture and

equipment. Familiarity with the room, as judged by the number of months the children had attended the kindergarten, was a significant factor in enabling them to reconstruct the environment.

To summarize, theory and research concerning the spatial conceptualizations of young children support the use of a model to facilitate spatial representation in a large-scale space. Children appear to be able to work comfortably with surrogates of large scale spaces. Familiarity is shown to be a factor in the ability of children to form spatial representations of large environments.

Kelly's Construct Theory

Kelly's (1955) theory of constructs has been mentioned with regard to its underlying assumption that each individual forms his/her own perception of the environment. The theory proposes that individuals form personal constructs which affect their perceptions of events, and thereby influence their behaviors. Kelly considered the total system of a person's constructs as his personality. The procedure used, by Kelly and others, to learn about the personal constructs of adults involves presenting them with three items and having them choose two which are alike, explaining the reasons for their choice. Their explanations are used to develop sets of dichotomous constructs which are interpreted as representing the individual's ways of thinking about phenomena. Although no studies were found

where this technique had been used with children, it has been found to be of use with adults and may be useful in finding out about children's views of space, depending upon their level of verbal skill.

Summary: The Methodological Background

Part two of this chapter reviewed research relevant to the research methodology. Discussion pertained to the use of the room scan technique in preschool group settings, the use of a model to facilitate spatial orientations of young children to a large scale environment and the theory underlying the use of the construct task in interviewing young children.

The theory and methodology discussed in this chapter form the basis for the present study, described in the following chapters.

III. Chapter Three

The Design of the Study

Chapter III deals with the design of the study, describing the setting in which the research was conducted, the children who were studied, the instrumentation, pilot studies, data collection and data analysis procedures employed.

The study was designed to tap, along the dimensions of behavior and perception, aspects of the interactions between children in day care and the spatial characteristics of their day care environment.

A room scan technique was used to study the children's use of the room. Information about the children's perceptions of the room was gathered through individual interviews with them.

A. The Setting

The study was conducted in a non-profit, public day care center which serves a proportionately high number of low-income and single parent families. This particular day care center was chosen for several reasons. Firstly, the physical arrangement of the rooms was such that the various settings within the room were physically distinct, facilitating the setting-by-setting approach to be used in the room scan. Secondly, playrooms were organized in family aged groupings, facilitating comparisons across ages. Thirdly, the center has an exceptionally stable staffing

pattern. Finally, the staff of the center were willing to cooperate with the study.

The room in which the study was conducted was chosen by the day care director, from the four classrooms in the center, as the one most suitable for the study.

The playroom assigned was approximately 7.4 x 14.8 meters in size. It was divided by furniture and equipment into smaller areas. (See Figure 1 (p. 39) for a plan of the room.) The supervising teacher agreed to keep the arrangements of furniture and equipment stable throughout the study period. Most of the areas appeared, at first impression, to have distinctive functions associated with the materials stored in them. Discussions with the supervising teacher confirmed these functions and revealed certain behavioral expectations associated with each area. For the purposes of the study, the following areas (settings) were delineated. Names assigned to the settings tended to reflect the contents and activities associated with them:

1. Hall/toilet area: The hall/toilet area was divided into two parts: a small room containing two toilets opened onto a short hallway. There was a doorway between the two parts, but no door. The hallway served as a transition area for persons moving in and out of the room. It also contained a small bench for persons waiting to use the toilet area. Two children could use the toilet area at one time. Children who were waiting to use the toilet area were expected to sit on

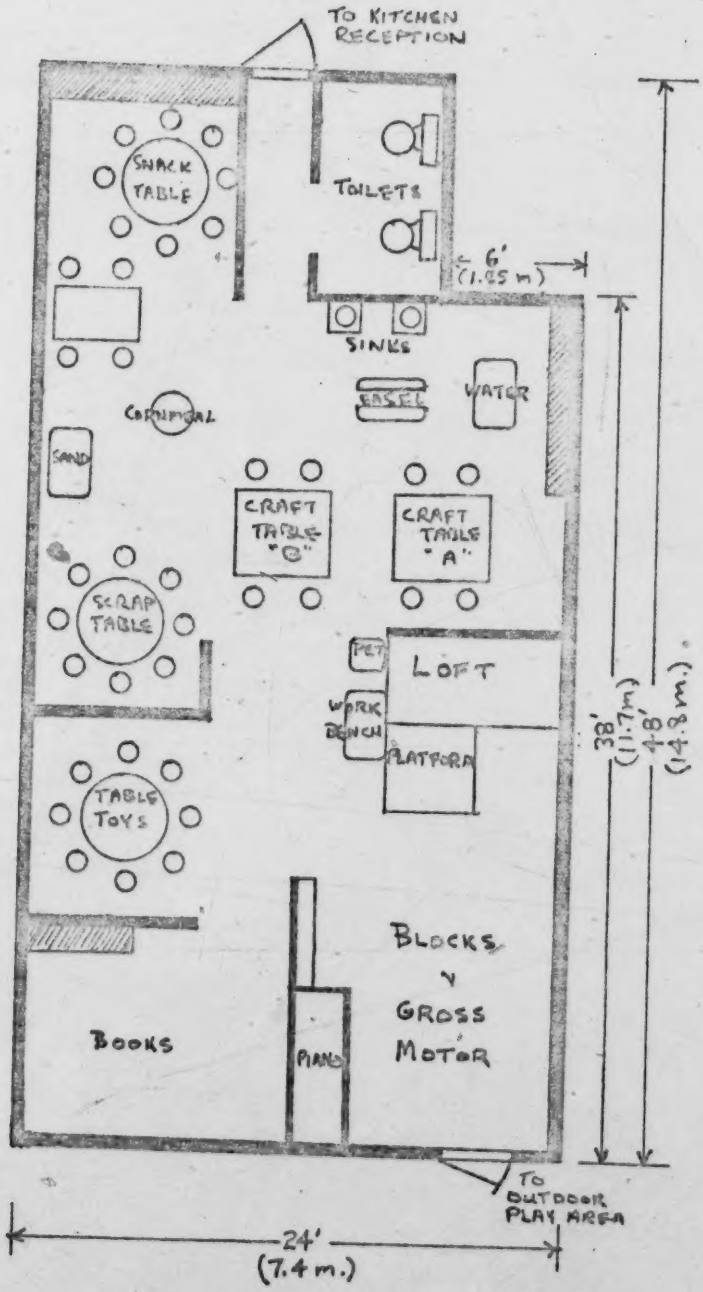

Figure 1
Plan of the Day Care Playroom

the bench to wait.

2. Water/easel/sink area: The water/easel/sink area was basically rectangular in shape. It was the third largest setting, but appeared rather crowded because of the amount of equipment contained in it. The setting served a variety of functions. Children used the sinks to wash their hands after using the toilets, before lunch and other times when this was necessary. A mirror and individual combs were also located in the setting. The water table and easel were located near the sinks, probably for convenience in maintenance and cleanup. Flooring in this area was linoleum. A maximum of two children were permitted to play at the water table, which contained accessories appropriate to water play. The easel could accommodate two children who were painting or one side might be converted to a chalk board. There were no restrictions observed as to the number of children who might occupy the entire setting at one time. It would have been possible for as many as six or seven children to be occupied at the various activities.

3. Craft area A: Craft area A consisted of a square table, about 1 meter x 1 meter in size, and the space for sitting around it. The space also extended toward the center of the room to meet the space around the table in craft area B, so was basically rectangular in shape. The setting was enclosed, on two sides, by the playroom wall and by storage shelves separating it from the house area. The remaining two sides were open to craft area B and the water/easel/sink

area. Flooring in this area was linoleum. During the free play period, the table in this setting was usually set up with materials for a specific art or craft activity. The number of children who were permitted to work at the table was defined by the number of sets of materials put out, usually four to six. This table, like those in settings 12 and 13, was used, at lunch time, as a dining table.

4. House area: The house area was one of the smallest settings. It was located under the loft so had a height of about 1.5 meters and covered an area slightly more than 1 by 2 meters in size. The house area contained play house equipment including a table, chairs, cupboards, dishes and a phone. This setting was located in the part of the room having a rug on the floor. There were no restrictions as to the number of persons who could play in the house area.

5. Loft area: The loft consisted of a platform 1 x 2 meters in size and about 1.5 meters above the floor, with an access ladder against the wall, extending from craft area A. The loft was enclosed with a wood and rope railing about .6 meters in height above the floor of the loft. The type of equipment and materials available in the loft changed at intervals of several weeks. During the data collection period, a commercial adventure toy set and several toy vehicles were in the loft; however, it had been used as a "hospital" just prior to that. A maximum of two children were generally allowed to play in the loft , although three were permitted for hospital play. The loft was one of the

smallest settings.

6. Block/large movement area: The block/large movement area was the largest setting. It was approximately rectangular in shape, enclosed by the loft on one end, playroom walls on one end and one side and shelves on the remaining side. The floor in this setting was carpeted. Blocks of various sizes and toy vehicles were stored in the shelves in the area. The piano, a record player and a platform (about 1 x 1 meters in size and 1 meter high) adjoining the loft were also located in this setting. A large doll bed extended out from the house area into this setting. The area was intended for block play, dramatic play, dance and other active activities. There was no restriction as to the number of children who might play in this area at one time.

7. Book area: The book area was the fourth largest setting, basically rectangular in shape, and located at the far end of the room from the hall door. The setting was enclosed by the playroom walls on one end and one side and shelves on the other end and side. A large window, fitted with shelves for plants, stretched along one side of the setting. The floor was carpeted. The setting contained a shelf unit with books, a rocking chair, a low soft bench and curtained cupboards. There were no restrictions as to the number of children who could occupy the book area. Children were expected to use this area quietly. Stories were read to groups of children in this area, though not usually during the free play period.

8. Table toy area: The table toy area was one of the smaller settings, consisting of a round table (about 1 meter in diameter) and the area immediately surrounding it. The setting was square in shape, enclosed on one side by the playroom wall and on two sides by storage shelves. The remaining side was open to the access area. The storage shelves house a variety of manipulative materials intended for use on the table. Use of the area was restricted by the number of chairs available, usually about six. The children were familiar with this limit, as they were in the other areas where the same method of limitation was employed. This setting was in the carpeted area of the room.

9. Access area: This was an irregularly shaped area in the center of the room. It functioned mainly as an access area to the block/large movement area, the book area, the house area and the table toy area. The one activity implied in the area had to do with the care of the guinea pig, whose cage was located in the setting. Cots and a workbench (not in use) were stored in the setting during the study period. The setting was bordered by the end of the loft and the adjoining platform on one side, sets of shelves on two sides, and was open to craft areas A and B on the remaining side. It was located in the carpeted portion of the room. There was no restriction as to the number of persons who might be in this area.

10. Scrap table area: The scrap table area was another of the settings which was comprised of a table and the area

immediately surrounding it. The setting was roughly square in shape, enclosed by storage shelves on two sides and a wall on another. The shelves contained scrap materials such as containers, cardboard, construction paper, glue, string and tape. These materials were intended for use by the children in projects initiated by them. The number of children using the area was restricted by the number of chairs available, usually five or six.

11. Sand/cornmeal area: The sand/cornmeal area consisted of a rectangular sand table and a circular cornmeal table. Each table contained appropriate play accessories. The sand/cornmeal area was not delineated by boundaries other than the playroom wall along one side of it. For research purposes, the setting was seen as including the two tables and the area surrounding them in which children would stand to play. The setting was therefore irregularly shaped and quite small. Floor in the area was covered with linoleum. There did not appear to be restrictions as to the number of persons who might play in this area although four or five persons would be the maximum number that could comfortably use it.

12. Special projects/snack area: The special projects/snack area was the second largest setting, located at one side of the room on the end nearest the door. The setting was rectangular in shape and was enclosed on three sides by playroom walls. One long side was open to the sand/cornmeal area and craft area B. The special projects/snack area was

sometimes designated, by the children, as the "kindergarten area" because it tended to be used by the oldest group of children for eating lunch and for certain teacher-directed projects. This setting contained two tables and considerable closed storage space. During the morning free play period, one of the tables contained the morning snack and children were expected to sit at that table while eating their snack. Approximately six children could sit at the snack table at one time, while four others might be accommodated at the other table in this setting.

13. Craft area B: This setting consisted of a square table, about 1 meter in diameter, and the area immediately surrounding it. There were no boundaries around the setting. It was open to craft area A, the sand/cornmeal area, the kindergarten area and the access area. The area was similar in function to the one in craft area A. It was usually set up, during the free play period, with materials for a specific art or craft activity. The number of children who might use the table at once was limited by the number of sets of materials provided, usually four to six.

The Program

Daily activities in the day care room showed considerable variety but tended to follow a regular time sequence. Children arrived at the center at various times throughout the morning, although most tended to be in the room by 9:00 a.m. The free play period usually extended from the time that the children began to arrive until 10:00 a.m.,

approximately one hour. During this time, all of the settings in the room were available to the children and they were free to choose their own activities. Craft areas A and B were set up for specific art or craft projects and teachers were available to work with the children on these. Small, and occasionally large group activities (story-telling sessions or games, for example) sometimes developed from the teacher's interactions with the children during the free play time. Participation in these activities by the children was, however, voluntary, and this appeared to be understood by the children. A snack was available in the special projects/snack area during the free play period. Children choosing to have a snack were expected to do so within that period of time. Shortly after 10:00 a.m., when weather conditions were suitable, the children were taken outside, returning to the room for a short story or group activity before lunch. Following lunch, the oldest group of children were taken to another room in the center for a planned activity of about a half hour duration. They then returned to the playroom and joined the other children who were resting. The children were awakened at 2:00 p.m. and spent the time until they were picked up by their parents in free play and group activities. Afternoon and morning snacks were available to the children at their choice.

B. The Children

Because the focus of the study was upon the interactions of the various components comprising the environment of the room, it was planned, initially, that all of the 19 children in the room would be included in the study. A decision was later made to exclude from analysis, data on one handicapped child and the one-to-one aide who worked with him, on the basis that his actions were directed by her and could not be considered as free play, and because her attention was devoted almost exclusively to him. Although this child and teacher interacted primarily with each other, they were nevertheless an integral part of the playroom. The other children often made overtures to this child and were encouraged to do so within the limits necessary for his safety and security. The deletion of data concerning this child's activities, although necessary within the terms of this study, must be seen as detracting from the presentation of a complete picture of the interactions and activities in the room.

It also became apparent during the data analysis that the accuracy of the findings might be seriously affected by the effects of low child attendance. At that point, it was considered necessary to delete data on two children who had been absent for more than .67 of the room scan periods. Data was used, therefore, for a total of 16 children.

Prior to the study, assurance was obtained from the director that new children would not be introduced to the

room during the course of the data collection and new children were not, in fact, introduced. Care was taken, as well, to conduct the study during a period when it was anticipated that staffing would be stable. Information was sent to the parents or guardians of the children and approvals were obtained from them for the inclusion of their child in the study and for the video- and audiotaping to be done as a part of it. Consent forms were also completed by the staff persons working in the room.

At the time that the study began, the children ranged in age from 3.3 years to 6.2 years. For study purposes, children were grouped into three age categories which corresponded to their probable dates of school entrance. The oldest group of children, aged 5.3 to 6.2 years, consisted of two girls and four boys. The middle age grouping was composed of children aged 4.3 to 5.2 years. There were five children in this category, two girls and three boys. The youngest group of children, those aged 3.3 to 4.2 years, also consisted of five children, three girls and two boys. The total group, therefore, was made up of sixteen children, seven girls and nine boys.

The four staff persons in the room consisted of the supervising teacher, another full-time teacher, a "special projects" teacher who worked in several rooms and worked primarily with the oldest group of children in this room, and a part-time teacher. During the data collection period, the room supervisor and/or the other full-time teacher were

usually in the room, at any given time, with or without any of the other teachers. The staff/child ratio varied, therefore, from 1:18 to 4:18. These figures exclude, as previously mentioned, the handicapped child and the one-to-one aide.

C. Instrumentation

The Room Scan

Data on the children's use of space was collected through the use of a room scan technique based upon that employed by P.L. McGrew and P.L. and W.C. McGrew (1972), with adaptations in accordance with Tyler (1975). The playroom was divided into thirteen areas, according to the location of furniture and equipment and the observed patterns of use by children and staff. Where the boundaries were not already delineated by the arrangements of furniture or equipment, they were marked with masking tape applied to the floor of the room. Corresponding grid sheets were developed, on which the settings were numbered to indicate the order in which the scan was conducted. Figure 2 (p. 50) shows a sample grid sheet, with the divisions of settings and order of scans marked. Researchers scanned the room at two-minute intervals, beginning at setting 1 and progressing by numerical order through the settings. In each setting, they marked, by name code, each of the children present, describing the activity of the children who were not engaged in setting-specific activities and circling children who

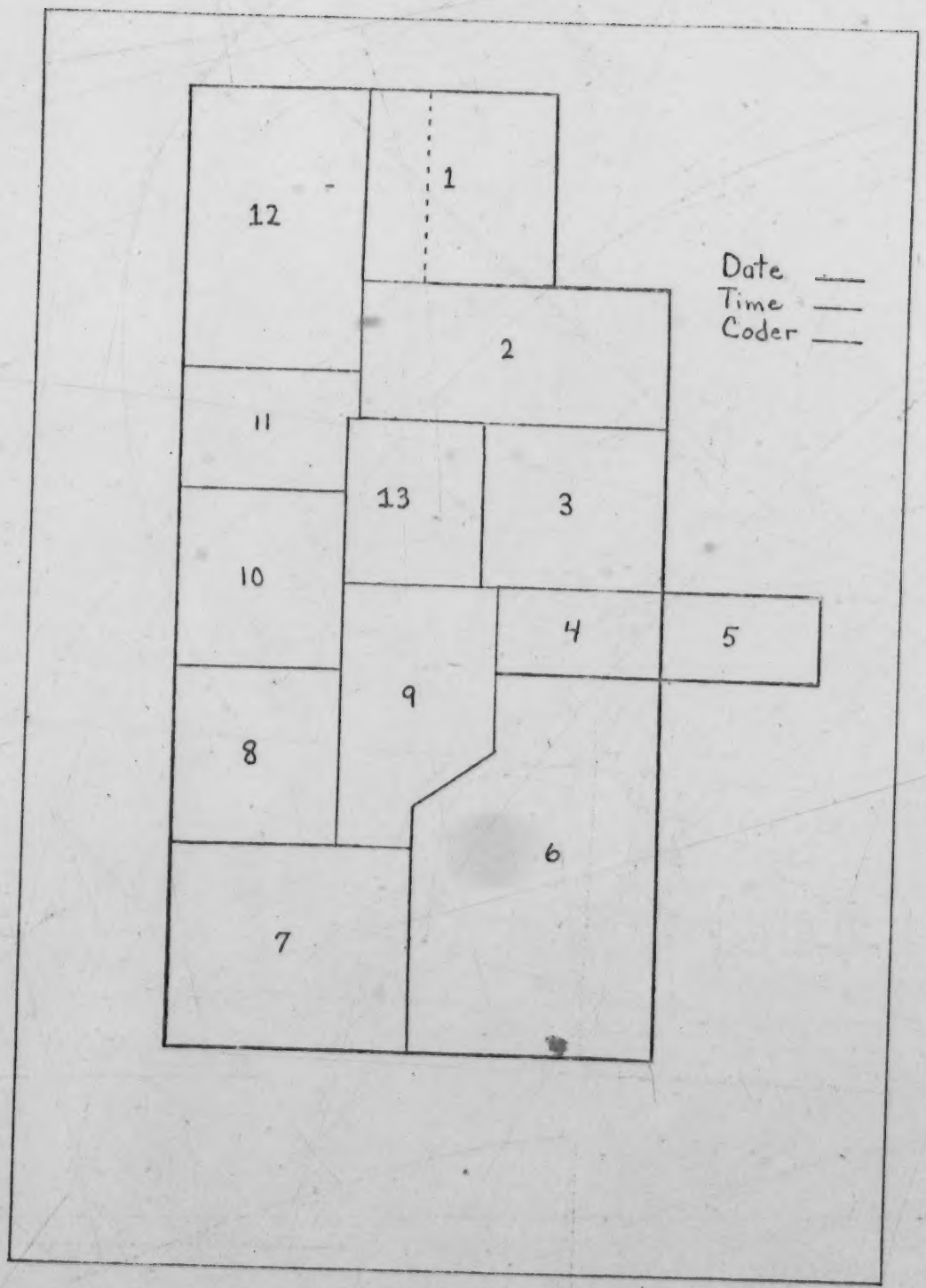

Figure 2
Grid Sheet Used for Room Scan

were engaged in solitary behavior. Children who were considered to be in transition were marked with an arrow and children who were watching were underlined. (Definitions of setting-specific activity, solitary behavior, and watching and transition activity have been presented in Chapter I.) Children were coded only once in each scan, on their first appearance in a setting. The room scan was conducted for one hour per day, during the morning free play time, over two five day periods. The time period involved was from 9:00 a.m. to 10:00 a.m., with the exception of one day when the free play period was from 10:00 a.m. to 11:00 a.m. Room scan data was collected for all of the nineteen children and five staff persons who normally occupied the room. Data for staff members and the three children mentioned above was then excluded from the data analysis.

D. Observer Agreement

Because observer agreement was considered to be important for the reliability of data, the pre-training of observers was important. Two observers were trained, prior to the study, to a level of agreement of 85.8% using the room scan technique. During the study period, the two observers alternated in collecting the data, one collecting on one day and the other on the next day. The level of agreement between the observers was calculated prior to beginning the study and on days two and nine of the room scan. The formula used for calculating interobserver

agreement was as follows (McGrew, 1972):

$$\frac{\text{no. seen by both A and B}}{\text{(no. seen by both A and B) + (no. seen by A) + (no. seen by B)}}$$

The average level of agreement attained over the three data collection periods, using ten scans per period, was 89.4%. The twenty scans used from day two and day nine of the data collection period represented 6.7% of the data used.

E. The Interviews

The children participated in two sets of interviews, the first set dealing with their preferred settings, companions and activities in their room and the second set designed to elicit mental constructs about the spatial characteristics of the room. (For convenience, the two sets of interviews will be referred to as the "model interviews" and the "construct interviews").

In the first set of interviews, the children were taken from the room, individually and in random order, to a private room where a model of the day care playroom (see Figure 3, p. 53) and appropriate audio- and videotaping equipment had been set up. The interviewer explained to the children that she would be asking them questions about the things they liked to do in their room and that the purpose of the model was to help them remember the things that were in their room. They were asked to refer to the model in

answering the following questions:

1. Can you show me what your favorite place is in your room, the place where you most like to be?
2. Do you have another place that you especially like, a second favorite place? Can you show me where it is?
3. When you are in the (favorite setting), would you rather be there alone, all by yourself, or with someone else?
4. (If a child said he would like to be there with someone else) Who would you most like to be with in the (favorite setting)?
5. When you are in the (favorite setting), what do you best like to do?

The successful use of the model in interviewing the children was considered to be dependent upon their ability to associate the model with the room that it represented and to associate the various settings in the model with the appropriate settings in the room. To ensure that the children were, in fact, making this association a series of experiences with the model, culminating in an individual testing situation, was conducted prior to the data collection. The model was introduced to the children in a group setting, where the pieces of furniture and equipment from the model were taken from a box and assembled, with the help of the children, in the appropriate places in the model. During this play session, each child was given an opportunity to move small "person" figures to various places in the room while the researcher and children talked about

the parts of the model as representative of the larger room. To test the level at which the children were able to understand the room-model relationship, a series of nine questions were formulated (see Appendix A). The children were tested individually on these questions, using the model. Each child was asked four questions, chosen sequentially from the list through all of the interviews. If a child was able to answer three of the four questions correctly, it was assumed that an appropriate level of understanding existed for the purposes of the model interview. If the child did not answer three of the four questions correctly, all of the nine questions were asked. A correct response to seven of the nine questions was considered to be sufficient for the child's inclusion in this portion of the study.

In the second set of interviews, photographs of the thirteen settings used in the room-scan were presented to each child, in sets of three, and the child was asked to find two that were the same in some way. The child was asked to describe the way in which they were the same and to tell how the remaining one was different. The basis chosen for the same-different distinction was noted by the interviewer. Each child was presented with four sets of pictures. The pictures composing the sets and the order in which the sets were presented were randomly selected, as was the order of the child interviews.

Prerequisite abilities for this interview task included

the ability to use the concepts "same" and "different" in situations where more than one correct response was possible and to verbalize the reasons for choices. To evaluate this ability, a series of same-different tasks was devised and used with the children prior to the data collection (see Appendix B). The researcher's judgement as to the level of competence demonstrated by the child in the tasks determined whether or not the child was included in this set of interviews. Children were considered to be able to participate in the research tasks if they were able to make some judgement as to same and different characteristics of the items shown them, and to verbalize the reasons for their decisions. To determine the children's ability to associate the photographs of the settings with the actual settings, children were asked, some time prior to the construct interview, to lead the interviewer to areas of the room which were shown in each picture. The ability to find each of the settings from the appropriate picture was considered necessary for the performance of the interview task.

Findings from the interviews concerning the children's preference for being "alone" or "with someone else" in the favorite setting, considered along with the designation of "solitary" used in the room scan, gave rise to a final set of interviews designed to try to find out about each child's definition of "alone" and "not alone". A set of color photographs of children in various relationships with others (alone; in a group of four; as one of a pair; in physical

proximity to others but engaged in a different activity; physically apart and engaged in a different activity than others) were shown to each child and the child was asked , in each case, whether the child illustrated was "alone, all by himself" or "not alone".

F. Pilot Studies

A pilot study using the McGrew (1972) room scan technique was conducted at a different day care center several months prior to the beginning of this research. Indications from the pilot study were that the room scan technique could successfully be used to trace the movements of children in a day care center and that an acceptable level of reliability could be reached. On the basis of this, modifications were made to meet the specific purposes of the study. These involved scanning by settings rather than by marked squares, coding for "non-setting specific", "watching" and "transition" behavior, and developing a more discrete operational definition of solitary behavior.

The "model" interviews were piloted with four children from another playroom in the same day care center. This room was similar in layout and equipment to the room employed in the research. As a result of this pilot, the question "Who do you most like to be with in the (favorite setting)?" was revised to include the possibility of preferring to be alone in the setting.

G. Data Collection

In the two weeks prior to the actual data collection, time was spent each day at the day care center for purposes of becoming familiar with children and staff, in training and establishing agreement between the two observers, and in beginning the work with the children which would form the basis for the interviews. The latter involved establishing model recognition, interviewing for "same" and "different" concepts, and establishing recognition of the photographs of the settings. The basic data collection period extended over three weeks. During the first week, room scan data was collected for a one hour period each day, during the morning free play time. "Model" and "construct" interviews were conducted in the second week. Room scan data was collected again in the third week. In the week following the data collection period, the children were interviewed regarding their concepts of "alone" and "not alone".

Two persons were involved in collecting the data. The writer collected all interview data and data for every other day of the room scan periods. A second observer collected room scan data for alternating days. All interviews were audio-taped and a sample of three each of the "construct" and "model" interviews was videotaped.

H. Data Analysis

The data which was gathered in this investigation consisted of three hundred room scan observations, representing thirty scans per day over two five-day periods, and information derived from two sets of interviews with the children, described, for convenience, as "model" interviews and "construct" interviews. In addition, incidental observations and discussions with staff and students yielded information relevant to the study.

Room scan data was analyzed by computer to provide frequency and proportion data regarding the settings used, the activities observed, and the relationship of children to other persons, Interview data was then compared, manually, with the room scan data to find the degree of correspondence between child responses and each child's observed behavior.

In the case of both room scan and interview data, it was necessary to eliminate data for some children for some areas of investigation. In the coding of the room scan data, categories were included for the coding of children who were out of the room or center at the time of the scan, who were moving in the room such that they were not included in a scan, or who were engaged in activities which could not be considered as free play because of the amount of teacher direction involved. Where children were coded in these three categories for .67 or more of the three hundred scans, data for these children was eliminated from the analysis. (Data for two children was eliminated for this reason.) The

usefulness of interview data for individual children was governed by the ability of the children to comprehend key concepts involved in the interview, as determined by preliminary interviews designed to investigate various aspects of the child's understanding. The nature of these interviews and the levels of performance required are outlined in the section of this chapter dealing with the interviews.

I. Summary

The study was designed to investigate two aspects of children's interaction with the spatial characteristics of their day care environment: their use of the space in their and their perceptions of it. Sixteen children were studied. The instruments used to derive the two types of data were a room scan technique to record use of the room and interviews to determine the children's perceptions of it. The basic data collection period extended over three weeks. Pilot studies were conducted, prior to that, for both the room scan and the interview portions of the study. Room scan data was analyzed by computer to show fequencies and proportions and was then related, manually, to the interview data for each child.

The findings from the data analysis are discussed in the following chapter.

IV. Chapter Four

Data Analysis

In this chapter, data is presented in four parts. The first three parts correspond to the three major groupings of research questions as outlined in Chapter I, while the fourth contains other related data. In Part A, data is presented which relates to the children's observed use of space. Part B contains data on the children's perceptions of their use of space. In Part C, data relating the children's observed use of space to their perceptions of space is outlined. Part D contains data relating to teacher use of settings as well as incidental data arising from informal observations and discussions during the course of the study.

A. Data Concerning the Children's Observed Use of Space

The research questions relating to the children's observed use of space concerned the frequency with which children were observed to be present in each setting in the day care playroom, the frequency with which children were observed to be solitary, the frequency with which children were engaged in setting specific activity and the frequency with which children used settings simultaneously with other children and with adults. For each of these areas of concern, the data was analyzed by child, by age grouping and by sex grouping.

Presence in Day Care Settings

Table 1 (p. 63) shows the proportion of the total scans for which each child was present in the room that he or she was observed to be present in each setting of the day care playroom. The number of times that each child was present is provided, as well, because these figures form the basis for the calculation of the proportions. In order that children's scores may be related more easily to mean scores for settings, the high and low scores and the mean scores for each setting are also summarized in the table.

As shown in Table 1, levels of use of settings by individual children ranged from .00 (in 23 instances) to .44 (for child 02 in the scrap table area). Seven of the 16 children are shown as spending more than .25 of their time in one setting, while 3 of these children spent an additional .25 or more of their time at a second center. All of the children showed use levels of at least .18 in one of the centers. The high, low and mean scores for settings give an indication as to the representativeness of setting scores across the range of children. It can be seen, for example, that scores for the hall/toilet area are representative for all children in that the mean of .02 falls near the midpoint of the range of scores (.00 to .05). Scores for the scrap table area, however, are not representative for all children since the mean of .07 falls considerably below the midpoint of the .00 to .44 range of scores.

Table 2 (p. 65) summarizes the data on setting use

TABLE 1

PROPORTION OF SETTING USE, BY CHILD, SHOWING HIGH, LOW AND MEAN SCORES FOR SETTINGS

Child No. / Setting	Setting													No. of Room Scans Child Was Present
	Hall/ Toilet Area	Water/ Easel/ Sink Area	Craft Area A	House Area	Loft Area	Block/ Large Movement Area	Book Area	Table Toy Area	Access Area	Scrap Table Area	Sand/ Cornmeal Area	Special Projects/ Snack Area	Craft Area B	
01	.01	.04	.18	.08	.14	.13	.10	.03	.00	.04	.03	.17	.04	265
02	.01	.02	.06	.01	.04	.28	.03	.03	.02	.44	.01	.07	.01	192
03	.01	.14	.10	.02	.00	.23	.07	.04	.03	.04	.00	.22	.10	137
04	.02	.16	.05	.01	.00	.27	.09	.10	.03	.01	.03	.16	.09	139
05	.00	.07	.16	.01	.01	.05	.09	.11	.02	.06	.05	.19	.18	170
06	.05	.10	.05	.00	.03	.13	.08	.07	.02	.06	.20	.17	.03	262
07	.00	.09	.15	.00	.10	.11	.03	.19	.01	.01	.19	.08	.03	291
08	.01	.05	.16	.12	.11	.12	.03	.10	.03	.03	.04	.18	.02	264
09	.04	.14	.01	.00	.12	.23	.15	.02	.00	.00	.05	.18	.06	222
10	.02	.03	.28	.03	.09	.11	.07	.00	.00	.01	.02	.27	.06	177
11	.01	.19	.01	.02	.15	.27	.03	.03	.00	.00	.05	.14	.08	202
12	.00	.04	.00	.13	.00	.32	.15	.12	.01	.01	.01	.18	.01	139
13	.02	.05	.11	.06	.08	.16	.05	.14	.02	.06	.01	.22	.02	238
14	.02	.04	.15	.10	.01	.22	.08	.05	.03	.06	.02	.09	.11	288
15	.00	.07	.04	.00	.00	.26	.11	.04	.08	.28	.00	.05	.05	136
16	.01	.02	.17	.11	.00	.31	.04	.12	.03	.07	.06	.01	.06	216
High Score for Setting	.05	.19	.28	.13	.15	.32	.15	.14	.08	.44	.20	.22	.18	.19
Low Score for Setting	.00	.02	.00	.00	.00	.05	.03	.00	.00	.00	.00	.01	.01	.01
Mean Score for Setting	.02	.08	.11	.05	.05	.20	.08	.07	.02	.07	.05	.15	.06	.08

according to age and sex groupings. The proportionate uses for the three age groupings of children suggest a tendency for the younger children to spend more time in the water/sink/ easel area, the house area and the block area while the older children spent relatively more time in craft area A, the access area, the scrap table area and the sand/cornmeal area. Table 2 shows the group of girls as having higher levels of use of craft area A, the house area, the block/large movement area and the special projects/snack area. Levels of use by the group of boys were higher for the hall/toilet area, the water/easel/sink area, the loft area, the table toy area, the scrap table area and the sand/cornmeal area. Equal use levels by boys and girls were found in the book area and the access area.

Setting Specific, Watching and Transition Behaviors

Table 3 (p. 66) shows the proportions of setting-specific, watching and transition behaviors observed for each child. The total number of scans upon which the proportions are based is also included.

The level of non-setting specific activity, as shown in Table 3, did not exceed .05 for any child in any setting. The children tended to use the settings in the manner designated by the materials stored in them. The non-setting specific behaviors were, in the main, teacher condoned or instigated. At one point, a teacher moved the rocking chair from the book corner to the access area to read a story to a child who had requested one, and several other children

TABLE 2

PROPORTION OF SETTING USE, BY AGE AND SEX GROUPING

Age Grouping / Setting	AVERAGE OF PROPORTIONS FROM TABLE 1												
	Hall Toilet Area	Water/ Easel/ Sink Area	Craft AreaA	House Area	Loft Area	Block/ Large Movement Area	Book Area	Table Toy Area	Access Area	Scrap Table Area	Sand/ Cornmeal Area	Special Projects/ Snack Area	Craft Area B
Oldest (5.3 to 6.2 yrs.)	.01	.06	.15	.02	.07	.16	.07	.07	.06	.11	.09	.15	.04
Middle (4.3 to 5.2 yrs.)	.02	.07	.09	.06	.05	.19	.10	.08	.02	.04	.03	.17	.08
Youngest (3.3 to 4.2 yrs.)	.01	.10	.11	.07	.05	.23	.05	.08	.03	.03	.04	.14	.06
Means	.02	.08	.11	.05	.05	.19	.08	.07	.03	.06	.05	.15	.06
Sex Groupings													
Girls	.01	.05	.16	.08	.05	.20	.07	.07	.02	.04	.03	.16	.05
Boys	.02	.10	.08	.01	.06	.18	.07	.08	.02	.09	.08	.15	.06
Means	.02	.08	.12	.05	.05	.19	.07	.07	.02	.07	.05	.15	.06

TABLE 3
PROPORTION OF ACTIVITY TYPE, BY CHILD

Child No / Activity	Setting Specific Activity	Non-Setting Specific Activity	Watching Activity	Transition Activity	No. of Room Scans Present
01	.91	.04	.04	.01	286
02	.97	.00	.01	.02	209
03	.91	.01	.04	.03	137
04	.88	.00	.06	.06	139
05	.91	.00	.09	.00	170
06	.91	.00	.06	.02	277
07	.96	.00	.03	.01	291
08	.90	.04	.03	.02	264
09	.97	.00	.01	.02	222
10	.87	.05	.07	.02	196
11	.97	.00	.00	.02	202
12	.85	.12	.04	.00	139
13	.95	.00	.02	.03	238
14	.90	.00	.07	.02	288
15	.90	.03	.02	.04	153
16	.88	.00	.09	.04	217
Means	.92	.02	.04	.02	214

gathered in that area to listen. The only other instances of non-setting specific activity involved the use of the loft for hospital play and for houseplay. The loft had been set up as a hospital just prior to the beginning of the study, so that this alternate use had been a condoned behavior at a previous point in time. Both alternate uses (house play and hospital play) were approved by the teachers for the loft area.

Levels of watching behavior ranged from .01 to .09 for the various children, with a mean level of .04.

Transition behaviors are shown in Table 5 as ranging from .00 to .06 for individual children, with a mean level of .02.

In Table 4 (p. 68), the data from Table 3 is grouped for age and sex. According to Table 4, variations are slight, among the age groupings, in the levels of setting specific, watching and transition behaviors. Table 4 shows the group of girls as being slightly higher than the group of boys in their levels of non-setting specific and watching behavior.

Solitary Behavior

Solitary behavior was coded for a child when he was observed to be at least one meter distant from any other person, engaged in an activity different from that of any other person and not communicating verbally with any other person. The proportion of solitary behavior, for each child, is shown in Table 5 (p. 69). Because it forms the basis for

TABLE 4

PROPORTION OF ACTIVITY TYPE, BY AGE AND SEX GROUPING

Age Groupings / Activity	Average of Group Proportions			
	Setting Specific Activity	Non-Setting Specific Activity	Watching Activity	Transition Activity
Oldest	.92	.02	.04	.02
Middle	.94	.00	.05	.01
Youngest	.91	.01	.04	.03
Means	.92	.02	.04	.02
Sex Groupings				
Girls	.88	.04	.06	.02
Boys	.94	.00	.03	.02
Means	.91	.02	.05	.02

TABLE 5

PROPORTION OF SOLITARY BEHAVIOR, BY CHILD

Child No.	Proportion of Solitary Behavior	No. of Room Scans Present
01	.11	282
02	.06	204
03	.11	133
04	.07	130
05	.15	170
06	.14	271
07	.12	288
08	.12	259
09	.14	217
10	.01	193
11	.11	198
12	.01	139
13	.10	232
14	.07	281
15	.13	146
16	.08	209
Means	.10	210

the calculation of the proportions, the total number of scans for which each child was present is also included in the table. For individual children, the proportion of solitary behavior coded and scored ranged from .01 to .15, with a mean for all children of .09. Scores for the three age groupings of children showed little variation among groups, with a level of .09 for the oldest group of children and of .10 for each of the other two groups. For the group of girls, the proportion of solitary behavior was .07. The boys showed a larger proportion of solitary behavior, at .12.

Simultaneous Setting Use

Scores for simultaneous setting use reflect the frequency with which each child is coded , during a given scan, as occupying the same setting as another child. It is important to note, however, that because procedures employed in the room scan were such that children were coded only on the basis of their first appearance on each scan, the identity of simultaneous pairs could only be determined if it was the first coding for each of the children in the pair. Levels of simultaneous setting use actually reflect a minimum level of simultaneous use for each child pair. Actual use by child pairs may, therefore, have been at a higher level than is shown in the data. Proportions are calculated on the number of scans that the members of the child pair were actually in the room together, that is, the total number of opportunities for simultaneous setting use.

Because of the irregular attendance of many of the children during the study period, the number of possibilities for simultaneous setting use varied widely among the child pairs, the lowest number of possibilities being 35 (For child 12, child 15) and the highest being 289 (for child 7, child 14). It is possible that the proportions scored for child pairs having a lower number of opportunities for being together may be somewhat less representative of overall behavioral patterns than for those having a larger number of such opportunities. Table 6 (p. 72) gives the proportions of simultaneous setting use for each of the possible child pairs and the high, low and mean scores for the instances of simultaneous setting use for each of the children. The table shows a wide variation, for each child, in the level of simultaneous setting use scored over the range of other children. Child 5 shows the least deviation from the mean (.19) over the range of scores (.12 to .27). In most cases, the variation is sufficient to indicate that the children tended to have substantially more interpersonal contact, as measured by simultaneous setting use, with some children than with others. Table 6 shows that in 12 cases, child pairs were observed to share settings for more than half (.50) of their possible times for being together. At the other extreme were child pairs who spent none (in 2 instances) or very little of their available time in the same setting. Again, this suggests distinct patterns of association among child pairs.

TABLE 6

MINIMUM PROPORTION OF SIMULTANEOUS SETTING USE BY CHILD PAIRS, SHOWING HIGH, LOW, AND MEAN SCORES FOR EACH CHILD

Child No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	High Score for Child	Low Score for Child	Mean Score for Child
01	X	.13	.15	.21	.13	.15	.17	.51	.10	.69	.08	.32	.12	.71	.03	.21	.71	.03	.25
02	.13	X	.15	.09	.16	.23	.23	.05	.18	.11	.12	.03	.24	.13	.59	.20	.59	.03	.18
03	.15	.15	X	.29	.20	.11	.07	.24	.33	.22	.30	.18	.27	.22	.03	.30	.30	.03	.20
04	.21	.09	.29	X	.20	.07	.13	.17	.49	.17	.64	.36	.29	.33	.02	.40	.64	.02	.26
05	.13	.16	.20	.20	X	.17	.18	.17	.12	.27	.24	.14	.27	.25	.20	.21	.27	.12	.19
06	.15	.23	.11	.07	.17	X	.46	.07	.06	.19	.01	.11	.13	.10	.22	.10	.46	.01	.15
07	.17	.23	.07	.13	.18	.46	X	.14	.08	.32	.03	.09	.15	.16	.43	.18	.46	.03	.19
08	.51	.05	.24	.17	.17	.07	.14	X	.07	.45	.08	.44	.10	.41	.04	.26	.51	.04	.21
09	.10	.18	.33	.49	.12	.06	.08	.07	X	.14	.62	.34	.24	.19	.08	.22	.62	.06	.22
10	.69	.11	.22	.17	.27	.19	.32	.45	.14	X	.12	.31	.15	.26	.05	.15	.69	.05	.24
11	.08	.12	.30	.64	.24	.01	.03	.08	.62	.12	X	.24	.26	.19	.07	.31	.64	.01	.22
12	.32	.03	.18	.36	.14	.11	.09	.44	.34	.31	.24	X	.36	.22	.00	.34	.44	.00	.23
13	.12	.24	.27	.29	.27	.13	.15	.10	.24	.15	.26	.36	X	.19	.24	.11	.36	.10	.21
14	.71	.13	.22	.33	.25	.10	.16	.41	.19	.26	.19	.22	.19	X	.10	.49	.71	.10	.26
15	.03	.59	.03	.02	.20	.22	.43	.04	.08	.05	.07	.00	.24	.10	X	.11	.59	.00	.15
16	.21	.20	.30	.40	.21	.10	.18	.26	.22	.15	.31	.34	.11	.49	.11	X	.49	.10	.24

B. Data Concerning Children's Perceptions of Their Use of Space

Data concerning the children's perceptions of their use of space was collected through individual interviews with the children. A room model was used to facilitate the children's responses. Prior to the interviews, the children were required to demonstrate their ability to relate various parts of the model to the corresponding parts of their room. This process is described in Chapter III. Two children, aged 3.4 and 3.5 years, were omitted from these interviews because they did not seem to show the necessary level of familiarity with the model. Responses are therefore reported for 14 of the 16 children included in the study.

Favorite Settings

Children were asked to indicate their "favorite" and "second-favorite" places to be in the room. Responses of "favorite" and "second-favorite" were considered, for purposes of data analysis, as interchangeable, on the grounds that both settings were "special" to some extent, for the child. An exception occurred with child 07, who responded with only one favorite place. The responses of the children, by child and by age and sex grouping, are shown in Table 7 (p. 74). This table shows the loft area as the one chosen most frequently by children, the water/easel/sink area as second and the block/large movement area as third. The settings not chosen at all were the two craft areas, A

TABLE 7

FREQUENCY WITH WHICH SETTINGS NAMED AS FAVORITES, BY CHILD , AGE AND SEX GROUPING
(2 RESPONSES/CHILD)

Setting	Total Response	Age Group			Sex Group	
		Oldest	Middle	Youngest	Girls	Boys
Hall/toilet area	5	2	2	1	3	2
Water/easel/sink area	0					
Craft area A	2		1	1	2	
House area	7	3	2	2	3	4
Loft area	5	2	2	1	1	4
Block/large movement area	3		3		1	2
Book area	0					
Table toy area	0					
Transition area	3	2		1	2	1
Scrap table area	1	1				1
Sand/cornmeal area	1	1				1
Special project/snack area	0					
Craft area B	1	1				1
No response	28	12	10	6	12	16
Total						

and B, the table toy area and the access area. Distributions of setting preference by age grouping show a rough correspondence, for most settings, to the distribution of children within the three groupings. Exceptions to this pattern occurred with the choice of the house area only by children of the middle and youngest age groupings (one child from each group) and the choice of the book area only by three children of the middle age grouping. Choice by girls was more frequent for the water/easel/sink area, the house area and the scrap table area. More boys than girls chose the loft area, the block/large movement area, the book area, the sand area and the special projects/snack area.

Preferred Activity in Favorite Setting

All but one of the children named a setting specific activity as their preferred activity for the favorite center. The exception was a boy, aged 4.3 years, who named "playing the piano" as his favorite activity for the book area. Since the piano was no longer in the book area but had been located there just prior to the beginning of the study, it is possible that the child, who was absent for several days at the time of the room rearrangement, was responding on the basis of the former location. The preference for setting specific activities by almost all the children fits closely with the room scan data which shows the large majority of behavior as setting specific.

C. Data Relating Use and Perceptions of Space

The data presented in this section concerns those research questions which were designed to relate aspects of the children's observed use of space to their interview responses concerning their use of space. Findings presented in this section does not include data from the two children omitted from the model interviews.

Use and Perceptions of Settings

Table 8 (p. 77) lists the favorite and second-favorite setting choices of the children, as well as the two settings used most frequency by them over the entire room scan period and over each of the two five-day scan periods. The room scan data was broken down according to the two scan periods to allow for the possibility that changes in child preference would occur over the three week period such that interview preferences might relate more closely to one of the five-day periods than to the other or to the total period of the scans. Settings having equal levels of use are indicated, as are periods for which the number of scans was less than 60. It should be noted that data calculated over a small number of scans may be less representative of total behavioral patterns than data calculated over larger numbers of scans.

Table 8 shows child 02, a boy aged 6.2 years, with a use of settings, throughout the scan periods, that was congruent with his expressed interview preferences. Data presented earlier indicated a high level of use of these

TABLE 8
SETTING PREFERENCES AND USE, BY CHILD

Child No.	Age	Favorite Settings as Expressed in Interview	Settings Most Frequently Used in Scan Period 1	Settings Most Frequently Used in Scan Period 2	Settings Most Frequently Used in Total Scan Period
01	5.7	scrap table block/large movement	loft block/large movement	craft area A special projects/snack	craft area A special projects/snack
02	6.2	scrap table block/large movenent	scrap table block/large movement	scrap table block/large movement	scrap table block/large movement
03	3.6	loft block/large movement	block/large movement craft area A, craft area B[1]	special projects/snack[2] block/large movement	block/large movement special projects/snack
05	4.9	block/large movement books	craft area B special projects/snack	craft area A special projects/snack	special projects/snack craft area B
06	6.2	water/easel/sink sand/cornmeal	sand/cornmeal block/large movement	special projects/snack water/easel/sink	sand/cornmeal special projects/snack
07	6.2	loft ---	sand/cornmeal table toys	craft area A table toys	table toys sand/cornmeal
08	3.8	house scrap table	loft block/large movement	craft area A special projects/snack	special projects/snack craft area A
09	4.3	books block/large movement	block/large movement special projects/snack	books water/easel/sink	block/large movement special projects/snack
10	5.9	loft water/easel/sink	loft blocks special projects[1]	craft area A[2] special projects/snack	craft area A special projects/snack
12	4.4	loft books	block/large movement special projects/snack	---[2] ---	block/large movement special projects/snack
13	5.2	loft water/easel/sink	special projects/snack table toys	special projects/snack craft area A, loft, blocks[1]	special projects/snack table toys
14	5.2	house water/easel/sink	block/large movement house	craft area A block/large movement	block/large movement craft area A
15	6.0	loft special projects/snack	books water/easel/sink	block/large movement[2] scrap table	scrap table block/large movement
16	3.3	water/easel/sink loft	block/large movement scrap table	craft area A table toys	block/large movement craft area A

1 Equal levels of usage were observed for these settings.
2 Total number of scans was less than 60 for this period.

areas by the child (.44 in settings 10, the scrap table area, and .28 in setting 6, the block/large movement area).

Child 03, a boy aged 3.6 years, showed a high use level for one of his preferred settings, the block/large movement area, for all of the scan periods.

Setting 6, the block/large movement area, was also an expressed favorite of child 09, a boy aged 4.3 years. This child showed a high level of use for this setting during the first scan period and over the total period.

Child 6 showed a pattern of similar use and preference for the sand/cornmeal area. This child was one of the oldest children, at 6.2 years of age.

Two other children, a girl aged 5.7 years and a girl aged 5.9 years, expressed preferences for settings which they used at a high level over the first scan period. The settings noted in these instances were the block/ large movement area and the loft area.

Another child who showed some similarity between use patterns and expressed settings preferences was child 13, who chose the loft area as a favorite and used it at the .08 level. This child was a boy, 5.2 years of age.

Some degree of consistency between expressed preferences and high use level was noted, therefore, in the data for seven of the fourteen children surveyed. Five of the total of eight boys in the group and two of the six girls showed some congruence between response and use. Of the seven children discussed, four were of the oldest group

of children, two were of the middle group and one was of the youngest age grouping. This may be compared with age breakdowns for the total group of children for whom data is included for this part of the study. In the total group of fourteen children, six were of the oldest group, five of the middle group and three of the youngest group.

Observed and Preferred Associations

An unexpected finding from the model interview was that the majority of the children, nine of the fourteen interviewed, reported that they preferred to be alone in their favorite setting. Of these nine children, five were girls and four were boys. Two were of the oldest group of children, four of the middle age group and three of the youngest group. Two types of data were collected in the course of the research which could be relevant to the expressed preference for aloneness. One type of data was the measure of solitary behavior, coded when a child was at least one meter distant from any other person, engaged in an activity different from that of other persons and not appearing to be engaged in verbal communication with any other person. The other type of data that is of possible relevance is the measure of simultaneous setting use, where presence in a setting simultaneously with another person would be seen as a level of interpersonal contact (an assumption implicit in W.C. McGrew's 1972 study). Unfortunately, the method of data collection was such that an accurate picture of "aloneness in a setting" was not

possible so that only the data concerning solitary behavior could be explored in relation to the expressed preferences of many of the children for "aloneness" in their favorite setting.

Calculations showed that the mean level of solitary behavior scored for these nine children was, at .09, only slightly lower than that for children who named other persons as their preferred companions in a setting (.10). Possible explanations for this finding included the possibility that the children's definitions of "aloneness" differed from the definition of solitary behavior employed in the research. If this was not the case, and the definitions were, in fact, similar, it appeared possible that the needs of these children for "aloneness" were not being met in the playroom. In an attempt to explore this possibility, the researcher formulated a series of interviews for use with the children to try to determine whether their concepts of "alone" and "not alone" corresponded to those used in the study. These interview tasks are described in Chapter III. The results indicated that the children agreed unanimously with the generally accepted definitions, involving the presence or absence of other persons, for pictures showing a single child, a pair of children and a group of children. The two remaining pictures used were, on the basis of the children's responses, judged to be unsuitable for the purpose of determining whether or not the children would define as

"alone" those conditions which, in the study, were considered as solitary. The condition combining factors of physical distance, type of activity and verbal communication was not adequately portrayed in the pictures used for that purpose, judging from the comments of the children. There was general disagreement as to whether the child portrayed in the pictures was, in fact, playing with the other children in the picture, depending upon the type of play which the child identified as occurring. Responses did appear to indicate that the children tended to make distinctions between "alone" and "not alone" on the basis of involvement in a kind of activity the same as, or different from, that of the rest of the group, as well as on the basis of simply the presence or absence of other persons.

Among the children who named other persons with whom they liked to play in their preferred setting were two reciprocal pairs, one, however, involving a child whose data was excluded, for reasons noted earlier. The choices of the two remaining children were not reciprocated. These choices involved children who said that they preferred to play alone. In all cases, the preferred companion choices of the children were of members of their own sex.

The expressed preferences of the children were all related to high levels of simultaneous setting use by the two children involved. Children 06 and 07 (two boys both aged 6.2 years) each of whom had named the other as the preferred companion in a favorite setting, were observed to

be together in a setting for .46 of their possible times together. Of that time, .43 was spent in setting 11, the sand/cornmeal area. The places where they were together in the next highest proportions were the water/easel sink area and the table toy area. In each of these settings, their proportionate use was .14. The settings named by the children in the interviews as being their favorite or second-favorite place to be were the water/easel/sink area and the sand area, by child 06, and the loft, by child 07. Thus the setting-activity-companion selections made by child 06 corresponded fairly closely to his actual behavior while those of child 07 corresponded only with regard to choice of companion.

In the instance where a reciprocal choice of preferred companion occurred but the interview data for one of the children was omitted from the stuiy, the two children, boys aged 4.3 and 3.5 years, were coded as being together in a setting for .62 of the possible scans. Their play was distributed throughout several settings, with the highest levels being in the block/large movement area (.34), the water/easel/sink area (.26) and the special projects/ snack area (.18). The preferred settings noted by the child whose interview data was included, child 9, were the book area and the block/ large movement area, so that there was a partial correspondence with regard to setting choice.

In an unreciprocated companion choice, by child 10 (a girl aged 5.9 years) of child 01 (a girl aged 5.7 years) the

proportion of simultaneous setting use was .69. The girls were most frequently together in the special projects/snack area (.28), the block/large movement area and the loft area (both shared at the .27 level). Preferred settings noted by child 10 were the loft and the water/easel/sink area, again showing partial consistency with the actual use by the pair of children.

A second unreciprocated choice occurred with child 15's choice of child 02 as a preferred companion in a favorite setting. These two boys were, respectively, 6.0 and 6.2 years of age. The proportion of simultaneous setting use by these two children was .59. Settings primarily used by the pair were the scrap table (.40) and the block/large movement area (.39). These do not correspond to child 15's choice of settings (the loft and the special projects/snack area) but do correspond with child 02's preferred and most frequently used settings. This finding might be seen as an indication that child 15 tends to join in child 02's chosen activities in order to spend time with him, thus neglecting his own preferred settings. This explanation might also apply with respect to child 07's neglect of his favorite setting, in the instance noted above.

For all of the pairs of children discussed above, the proportion of simultaneous setting use with their preferred companions was much higher than the overall mean levels for the children involved. Interview responses concerning the favorite or second favorite settings were totally or

"alone" those conditions which, in the study, were considered as solitary. The condition combining factors of physical distance, type of activity and verbal communication was not adequately portrayed in the pictures used for that purpose, judging from the comments of the children. There was general disagreement as to whether the child portrayed in the pictures was, in fact, playing with the other children in the picture, depending upon the type of play which the child identified as occurring. Responses did appear to indicate that the children tended to make distinctions between "alone" and "not alone" on the basis of involvement in a kind of activity the same as, or different from, that of the rest of the group, as well as on the basis of simply the presence or absence of other persons.

Among the children who named other persons with whom they liked to play in their preferred setting were two reciprocal pairs, one, however, involving a child whose data was excluded, for reasons noted earlier. The choices of the two remaining children were not reciprocated. These choices involved children who said that they preferred to play alone. In all cases, the preferred companion choices of the children were of members of their own sex.

The expressed preferences of the children were all related to high levels of simultaneous setting use by the two children involved. Children 06 and 07 (two boys both aged 6.2 years) each of whom had named the other as the preferred companion in a favorite setting, were observed to

be together in a setting for .46 of their possible times together. Of that time, .43 was spent in setting 11, the sand/cornmeal area. The places where they were together in the next highest proportions were the water/easel sink area and the table toy area. In each of these settings, their proportionate use was .14. The settings named by the children in the interviews as being their favorite or second-favorite place to be were the water/easel/sink area and the sand area, by child 06, and the loft, by child 07. Thus the setting-activity-companion selections made by child 06 corresponded fairly closely to his actual behavior while those of child 07 corresponded only with regard to choice of companion.

In the instance where a reciprocal choice of preferred companion occurred but the interview data for one of the children was omitted from the study, the two children, boys aged 4.3 and 3.5 years, were coded as being together in a setting for .62 of the possible scans. Their play was distributed throughout several settings, with the highest levels being in the block/large movement area (.34), the water/easel/sink area (.26) and the special projects/ snack area (.18). The preferred settings noted by the child whose interview data was included, child 9, were the book area and the block/ large movement area, so that there was a partial correspondence with regard to setting choice.

In an unreciprocated companion choice, by child 10 (a girl aged 5.9 years) of child 01 (a girl aged 5.7 years) the

proportion of simultaneous setting use was .69. The girls were most frequently together in the special projects/snack area (.28), the block/large movement area and the loft area (both shared at the .27 level). Preferred settings noted by child 10 were the loft and the water/easel/sink area, again showing partial consistency with the actual use by the pair of children.

A second unreciprocated choice occurred with child 15's choice of child 02 as a preferred companion in a favorite setting. These two boys were, respectively, 6.0 and 6.2 years of age. The proportion of simultaneous setting use by these two children was .59. Settings primarily used by the pair were the scrap table (.40) and the block/large movement area (.39). These do not correspond to child 15's choice of settings (the loft and the special projects/snack area) but do correspond with child 02's preferred and most frequently used settings. This finding might be seen as an indication that child 15 tends to join in child 02's chosen activities in order to spend time with him, thus neglecting his own preferred settings. This explanation might also apply with respect to child 07's neglect of his favorite setting, in the instance noted above.

For all of the pairs of children discussed above, the proportion of simultaneous setting use with their preferred companions was much higher than the overall mean levels for the children involved. Interview responses concerning the favorite or second favorite settings were totally or

partially consistent with the observed setting use of the pair of children for three of the children discussed. For the remaining children, the data serves to suggest the possibility that children may neglect their preferred settings in order to be with favorite companions.

Criteria Used for Distinguishing Same and Different Properties of Settings

Nine children were judged, according to the criteria outlined in Chapter III, to be sufficiently familiar with the prerequisite concepts and to have the necessary verbal ability to be interviewed for the constructs task. Of these nine children, six were of the oldest age group, two of the middle age group and one of the youngest group. There were five girls and four boys in the group.

The constructs interview was found to be a difficult one for many of the children. Several expressed frustration with the task and two children, a boy of the oldest age group and a girl of the youngest group, were unable to complete the interview. Four responses were recorded for each of the children, with the exception of the two children mentioned above, who responded three times each. This gave a total of 34 responses.

Responses were grouped into three categories, pertaining to characteristics of settings, activities in settings, and affective or ownership responses. Four sub-categories were developed for the category dealing with characteristics of settings. These had to do with contents

of settings, location of settings, colors in settings, and characteristics of materials in settings. Key words used by the children in their distinctions are noted under the appropriate category heading in Table 9 (p. 86). Table 9 gives the distribution of responses in these categories, for individual children and by age and sex grouping, as well as the number of children responding in each category. It should be noted that all but three of the children varied their responses to the extent that they fell into more than one category.

Table 9 shows that 29 of the 34 responses obtained distinguished sameness and differentness of settings on the basis of characteristics of settings. Within this category, the contents and location of the settings were each named thirteen times as the basis for discrimination. The remaining two categories, activities in settings and affective and ownership factors, were named much less frequently (three and two responses, respectively). Comparisons among age groupings are difficult because of the uneven distribution of children among the age groupings. Responses in the three major categories appear to be fairly equal for the group of boys and the group of girls.

D. Other Related Data

In Parts A, B and C of this chapter, data relating to the groups of research questions was presented. Part D contains data which does not relate directly to the research

TABLE 9
CONSTRUCT INTERVIEW RESPONSES, BY CHILD, AGE AND SEX GROUPING (4 RESPONSES/CHILD)

Factors in Settings	Total No. of Responses	No. of Children Responding	No. of Responses by Age Group			No. of Responses by Sex Group	
			Oldest	Middle	Youngest	Girls	Boys
1.Characteristics of settings:							
a.Contents of settings (tables,books, pictures,bulletin boards)	13	7	10	2	1	5	8
b.Location of settings (beside, close,far)	13	6	11	2	-	7	6
c.Colors in settings (black,brown)	2	1	-	2	-	2	-
d.Characteristics of materials in settings (strong)	1	1	1	-	-	1	-
Sub-totals	29	15	22	6	1	15	14
2.Activities in settings(play, sit,stand)	3	2	1	-	2	2	1
3.Affective and ownership, factors(like, don't like;I play "X" plays)	2	1	-	2	-	2	-
No response	2	-	1	-	1	1	1
Totals	36	18	24	8	4	20	16

questions but which appears to have relevance to the study. This pertains to time spent in the day care settings by teachers and to information arising from informal observations and discussions during the course of the study.

Presence in Day Care Settings by Teachers

The proportion of time spent in the day care settings by teachers is shown in Table 10 (p. 88). Proportions are based upon the total number of times that each teacher was observed to be present in the room. Table 10 shows levels of teacher use of settings as ranging from .00 (10 occurrences) to .53 (for the special projects teacher in the scrap table area). Mean proportions of teacher use show the hall/toilet, house, loft and sand/cornmeal areas as having the lowest levels of teacher use, at .01, and the special projects/snack area, the scrap table area and craft area B as having the highest use levels at .17, .16 and .16, respectively.

Incidental Data

During the course of the study, observations and discussions yielded information which did not fit into the design of the study but served to illuminate some of the findings.

The behavior of child 02, a boy aged 6.2 years, was of particular interest. This child was noted earlier as the one child for whom observed and reported settings preferences were congruent . His level of use of his two favorite settings was high, at .44 for the scrap table area and .28

TABLE 10
PROPORTION OF SETTING USE, BY TEACHER

Teacher / Setting	Hall/ Toilet Area	Water/ Easel/ Sink Area	Craft Area A	House Area	Loft Area	Block/ Large Movement Area	Book Area	Table Toy Area	Access Area	Scrap Table Area	Sand/ Cornmeal Area	Special Projects/ Snack Area	Craft Area B	No. of Room Scans Teacher Was Present
Room Supervisor	.01	.18	.14	.01	.00	.10	.03	.05	.04	.01	.00	.31	.12	173
Full-Time Teacher	.00	.13	.16	.01	.01	.11	.03	.02	.05	.06	.01	.22	.22	195
Special Projects Teacher	.01	.13	.07	.00	.00	.01	.00	.00	.01	.53	.01	.07	.14	97
Part-Time Teacher	.00	.22	.07	.00	.04	.09	.26	.00	.09	.02	.00	.07	.15	46
Mean Proportions	.01	.17	.11	.01	.01	.08	.08	.02	.05	.16	.01	.17	.16	.08

for the block/large movement area. This child's daily activities almost invariably included time spent at the block corner in dramatic play, usually with other persons, and time spent at the scrap table making props for himself and /or his friends for the dramatic play. During the study period, this play usually involved a Batman scenario, with props including capes and helmets ingeniously and skillfully constructed by this child, sometimes with the help of a friend or friends. A "Batmobile" was frequently built in the block corner (of large colorful blocks). An interesting aspect of this play became apparent during one observation period when several children who were in the block corner became engaged in an unusually heated argument, ending in blows and tears. It became obvious that, although child 02 was not at first involved in the dispute and was not in the setting (he did become involved at a later point), the disagreement stemmed from the fact that one child was trying to change a block construction that child 02 had made and three other children were "defending" it. The researcher later commented on the incident to the room supervisor who remarked that child 02 seemed to consider the block area as "his" property and that this sometimes caused problems. The observed incident seemed to show that not only was this the case but that the other children, or some of the other children, tended to concur in this perception of ownership. This was further supported by the fact that one child, in the construct interviews, distinguished between settings by

grouping two where "I play" and naming as different the block area where "(child 02) builds things".

A comment made by the room supervisor concerning child 07, a boy who was also 6.2 years of age, was of interest as well. The supervisor described child 07 as a child who liked to have time alone and who was often irritated by another child, child 06, who followed him around wanting to play. She mentioned having discussions with the two boys about child 07's need for time alone and her attempts to help child 06 understand and respect this need. These comments are interesting, firstly, in terms of their discrepancy with the research findings, which seemed to show child 07 as neglecting his preferred activities in order to be with child 06, named as his preferred companion. Secondly, they are interesting in that they reflect an awareness, by the supervisor, of privacy needs. It would appear possible that this awareness, as transmitted to the children through discussions such as the ones mentioned, would contribute to their own awareness of privacy needs and possibilities.

In this chapter, findings from the data analysis have been presented. Conclusions and implications of the findings will be discussed in Chapter V.

V. Chapter Five

Conclusions and Implications

The research described here was an attempt to learn about the spatial interactions of children in a day care playroom by examining the children's observed use of space and their perceptions of space. Basic to this approach is a view of human-environmental interaction as a complex, interdependent and dynamic system. Intervention is seen as occurring at two points in the system: one involving objective, or measurable, aspects of the interaction and one involving subjective, or phenomenological, aspects.

Research concerning the interactions of preschool children in group settings with the spatial characteristics of their environment establishes this topic as a useful one for investigation. Studies indicate that children respond to spatial factors, that spatial concepts have meaning for children and that children may use spatial concepts as a way of organizing their environment.

In this research, three aspects of the children's interaction with space were investigated: their presence in settings, their activities in settings and their associations in settings. A measure of actually observed use was obtained by employing a room scan technique. Interviews were used to find out about the perceptions of the children. A model of the playroom was used in the interviews to facilitate the spatial representations of the children. A construct technique was employed as a way of finding out

about the children's perceptions of settings in their room.

Study findings, grouped under the headings of presence, activity and association in settings, include the following:

1. Presence in settings:

Data on the use of settings by children showed a wide variation for individual children across the range of settings and for the different settings across the range of children. There was indication of possible differences in levels of presence in settings by the three age groupings of children. Interview responses showed the loft area as the setting receiving the most responses by children for favorite setting. With the exception of one child for whom observed use was congruent with expressed setting preference, there appeared to be partial or no consistency between the data obtained from the room scan and the interviews.

2. Activity in settings:

Measures of observed behavior showed a very high level of setting specific activity in settings. This corresponded to the naming, by all but one child, of setting specific activities as preferred activities in favorite settings.

3. Associations in settings:

Minimum levels of simultaneous setting use by pairs of children showed wide variation in association levels among child pairs. Interview responses by the children showed over half of the children as preferring to play alone in their favorite setting. This preference did not, however, appear

to be reflected in high observed levels of solitary behavior for these children. Levels of solitary behavior were found to be almost equal across age groupings. In all of the cases where children named other children as preferred companions in a favorite setting, a high level of simultaneous setting use was observed for that child pair. This occurred regardless of whether or not the child's choice was reciprocated.

Interview responses were based upon the use of the room model, hence the accuracy of this data was dependent upon the ability of the children to associate the model of the room with the actual room. Construct interview tasks required that the children be able to generalize about the same and different characteristics of settings and to verbalize the reasons for their decisions. Results of the construct interviews suggested that the perceptions of young children are difficult to measure by this technique, and that their constructs about space may be incomplete or only partially organized.

This study was intended to be introductory in nature, involving a basic data collection which would enable followup research. It was intended to generate suggestions for further research and for methodology. The research findings are generally tentative in nature. They are specific to the playroom and the children studied, at the time they were studied. They are also limited by methodological considerations related to the time period

involved and the number of children studied. The research findings serve to suggest the importance of certain variables in the interactions of children with the spatial characteristics of their environment. In the remainder of this chapter, the findings of the study will be discussed and questions raised which may serve to give direction to further research. Methodological concerns and implications will also be considered.

A. Discussion of the Findings

Because the study was constructed in such a way as to facilitate a comparison of the use and perceptions of space by children, findings concerning the relationship between the actually observed behaviors of the children and their expressed preferences are of particular interest. These findings included both areas of similarity and of difference. Among the areas showing similarities were the following: responses concerning preferred settings and actual observed use of settings were consistent for one child and partially consistent for several other children. With respect to the activities of children in settings, the high level of setting specific behavior was congruent with the expressed preference for setting specific activities by most children. In the associations of children, expressed preferences regarding companions in favorite settings were found to coincide with a high level of simultaneous setting use by the child pairs in question.

Areas of difference included discrepancies, for many of the children, between expressed setting preferences and actual use of settings.

The questions which arise from the examination of similarities and differences between observed use and expressed preferences concern the extent to which children are able to accurately report their favorite settings, activities and companions. Factors influencing this ability may include the age of the child and his ability to generalize over time.

A further question which arises from the findings relates to the conceptualization of human-environmental relationships in terms of a system in which human behavior both influences, and is influenced by, the environment. In the context of this study, the question which develops concerns the extent to which spatially-related behaviors and perceptions of the children were coerced by the space and the degree to which they were intentional, or acting upon the space. The study findings, considered along with other relevant research, offer clues as to the interaction of these two forces. These clues relate to the impact of setting characteristics such as size and shape, the part played by materials and activities, and the influence of other persons upon children.

Influence of Setting Characteristics

In the construct interviews, the children most frequently used characteristics of settings, particularly

their contents or location, to distinguish like and different settings. This finding suggests that children may use characteristics of settings as a way of organizing their perceptions about space. On the other hand, they may simply have been responding to the use of pictures and models of physical settings only to obtain reasons for their distinctions.

A finding which appeared to imply that characteristics of settings may influence use by children concerned the differential levels of use of craft areas A and B. These two settings offered the same types of activities yet showed use levels of .12 and .06 respectively. It is possible to speculate that the higher level of use in craft area A stemmed from the "enclosed" nature of the setting (near a wall, bordered on two sides by cupboards, and away from the flow of traffic), with craft area B being less popular because of its exposed nature (positioned near the center of the room, without boundaries on any side).

The influence of setting size upon the level of use by children was suggested by Shure's (1963) study which found that the highest use level was in the largest setting, the block area, and the lowest level of use was in the smallest center, in that case, the book area. In this study, the highest level of use was also in the largest setting, which was the block/large movement area. The lowest levels of use were found for the hall/toilet area, the access area, the house area, the loft area and the sand/cornmeal area. The

book area was one of the larger settings and has a level of use equal to the mean. Similarities among the settings havinglow levels of use may relate partially to the materials in, or activites associated with the space, as for the hall/toilet or access areas, or to size, because the house, loft, and sand/cornmeal area are among the smaller settings.

Interview data showed the loft area as receiving the most responses for favorite setting. Because it is a small, semi-enclosed area located above the rest of the room, it seems possible that its size and position were factors influencing the choice of the children. The level of actual use of the loft, however, does not appear to coincide with the expressed preferences of the children for that setting. The level of use for the loft is below the mean, at .05. It would appear possible that this low level of use may be related to restrictions imposed by the teachers as to the number of persons who may play in the loft at one time. This suggests that high use findings may not necessarily correspond with expressed preferences because of other factors, and that this possibility should be considered in interpretations of research data.

Influence of Materials and Activities

The findings and research discussed above with regard to the impact of setting characteristics upon use of space, suggest difficulties implicit in the separation of setting characteristics as factors related to behavior from other

influences such as teacher restrictions or the materials associated with a setting. For example, the high level of use for the block corner, noted in this study and in Shures (1963) research, might be interpreted as relating to the importance of the materials in a setting, in this case, the blocks.

Materials in a setting are, in turn, closely related to the activities associated with the setting. In this study, the definition of setting specific activity defines the activities specific to a setting in terms of the materials stored in that setting. That the children in this day care playroom had learned to associate specific activities with particular settings was indicated by the high degree of setting specific activity observed and by the expressed preferences of the children for setting specific activities. The interview responses, for example, showed that children who chose the block/large movement area as a favorite setting consistently named block play as their preferred activity for the setting.

Influence of Other Persons

Study findings indicated that some children may tend to neglect their own preferred settings in order to be with their favorite companions. This would suggest that these children made choices which gave interpersonal contact priority over other considerations in determining their use of space.

That teachers directly influenced the use of space by

children is indicated above, in the discussion of restrictions in the loft area. The structuring of space and regulation of space use by teachers would appear to have considerable impact upon the use of space by children. It seems possible that teachers may also indirectly influence children's interactions with space through their own use of space. In this context, it is interesting to note, for some settings, discrepancies between the levels of teacher and child presence. For example, teachers were observed to be present in craft area B more frequently than they were in craft area A, at levels of .16 and .11, respectively. The children, on the other hand, used craft area A almost twice as frequently as craft area B, with levels of child use at .11 for craft area A and .06 for craft area B.

It seems likely that teacher's discussions with children about spatial considerations might influence the children's use of space. In the playroom studied, the room supervisor reported discussions with children about their privacy needs. One might speculate that such discussions could contribute to a higher level of solitary behavior by children.

Wolfe's (1978) concept of privacy as involving the management of interaction and information implies intentionality on the part of the individual in his attempt to realize privacy. On the other hand, privacy issues are not totally subjective in that privacy can be fostered, as with the provision of private space. Aspects of the study

findings might be interpreted as relating to privacy. These include the expressed preferences of over one-half of the children for "aloneness" in their favorite setting and the expressed popularity of the loft area, an area showing a high level of solitary play and having characteristics which might be associated with privacy, including separation by height from the rest of the room and a relatively small size. These findings, when interpreted in the context of interaction management, seem to imply intentionality in the use of this space by children.

The use of space by children may reflect the interaction of intentionality with other factors such as the size of space, the materials available in it, or the restrictions imposed with regard to the space. For example, in the context of this study, competition with the needs of other children may have reduced the use score in a given setting for any one child. If this was the case, it might be that the number of children in the playroom would need to be reduced in order for the needs of the children to be met. Similarly, teacher management may have affected use scores. For example, discussing with a child another's need for privacy may have influenced his use of space such that scores for some settings would be reduced for some settings and increased for others.

Methodological Considerations

The comparison of the actually observed use of space with the perceptions of children aboutt space was intended

to generate information abou interactions with space by children in a day care playroom. The tentative nature of the findings has to do, in part, with the small number of children studied and the limited number of scans available for the children. The decision to employ frequency and proportion calculations in the analysis of data, and not to extend the analysis to include computation of significance, stemmed from the researcher's observation that, in some cases, the activity of one child during a one hour scan period served to influence to a considerable degree the scores for a particular setting or association. This developed from the combined effect of the limited number of scans, the relatively large number of settings and the varying levels of use among the settings. A more comprehensive representation of child behavior could, in future studies, be obtained by extending the data collection period over a longer time, by possibly extending the length of the daily observation time as well, and by including more than one group of children in the study.

In this study, the technique used for the room scan was such that, during each scan, each child was coded only on his first appearance. An unforseen consequence of this procedure was that scores for simultaneous setting use represented only a minimum level of setting sharing by each child pair. A true measure of simultaneous setting use could have been obtained if all child occurrences had been coded. The consistent order with which scans were conducted would

serve to provide the necessary indications with regard to the order of appearance.

In the course of the research, interviews were conducted with the children to investigate the nature of their concepts of "alone" and "not alone". This interview task is described in Chapter III. Problems which occurred with the task are described in Chapter IV. These seemed to stem primarily from the fact that the pictures used for the interview did not clearly depict conditions of distance from others, activity different from that of others and lack of verbal communication with others. A more useful approach to this task might be to use video-taped sequences in place of photographs, and to give more attention to reasons given by the children for their differentiations.

A general question about the methodology arises from the discrepancies noted in the findings between expressed preferences of children and their observed use of space. A possible implication of this difference, and one which must be considered, is that the use of the room model is not an effective way to find out about children's perceptions of space. Similarly, children's difficulties with regard to the construct tasks may indicate the inappropriateness of this type of task for use with young children.

B. Implications of the Study

The above discussion of the study findings and of the methodology which was employed has generated suggestions for further research and contains implications, as well, for day care practice. These suggestions and implications are outlined, briefly, below.

Implications for Further Research

Research implications arising from the methodology and findings of the study include the following:

1. The interactions of children with space should be viewed as involving both the impact of space upon children and the influence of children upon space. Spatial characteristics of settings should be considered in terms of their influence upon children's use and behaviors. At the same time, the intentionality of the child, as stemming from his or her social and personal needs, should not be disregarded.
2. Variables which should be considered in studying children's interactions with space include the characteristics of the settings, such as their size and shape; the kinds of materials and equipment available in settings; and the influence of other persons in the setting. Teacher management effects should be taken into account, as well as the age and sex of the children studied.
3. The room scan technique is a useful way of studying children's use of space. The room scan procedures used in this research should be modified slightly, as noted in the preceeding section.

4. To obtain a representative picture of child behavior, room scan techniques should be conducted over a longer time span than was used in this study, and for several groups of children.

5. A more intensive study should be made of children's concepts of, and desire for, "aloneness". This could be done by having children view videotaped sequences depicting a person in various relationships to others with regard to the factors of distance, activity and communication, asking them to describe the person as "alone" or "not alone" and noting the reasons that they give for their responses.

Implications for Day Care Practice

Implications for day care practice which arise from the findings are:

1. Day care environments should provide for different kinds of space. Differences should relate to size, shape and other characteristics of settings, the activities and materials available in settings, and opportunities for interpersonal contact (that is, provision for spaces where children may be alone or with varying sizes of groups).

2. Day care environments should provide a child/space ratio such that competition for space is minimized. A larger number of children occupying an available space implies an increased likelihood that a child's ability to use space in a way that he needs or desires to use it will be interfered with by attempts of other children to use space according to their needs and desires.

3. The effects of teacher management upon the use of space by children should be considered.

4. Where environments are being structured for children, there should be an awareness of a probable wide range of differences in terms of the way children interact with space. To accomodate this range, different kinds of space should be provided and programs structured such that children are able to choose the way in which they will interact with space.

5. Where environments are being structured for mixed-age groupings of children, there should be an awareness of the possibility that different ages of children interact differently with space, and accomodation should be made for this through the provision of different kinds of space and opportunities for choice by children.

The study of children's spatial interactions is seen as necessary to the construction of operational design principles for the structuring of day care environments. This research is intended to help provide a basis for such study. It is hoped that further study will be done in this area, and that suggestions evolving from this research will be useful to such work.

VI. Appendix A

A. Questions Used in Establishing Understanding of Model-Room Relationship

Children were requested to refer to the model in answering these questions. Each child was asked four questions, chosen sequentially from the list through all of the interviews. If a child was able to answer three or more of the four questions correctly, it was assumed that an appropriate level of understanding existed for the purposes of the model interview. If the child did not answer at least three out of the four questions correctly, all of the nine questions were asked. If the child was able to answer seven or more of the nine questions correctly, it was assumed that his understanding of the model-room relationship was sufficient for his inclusion in the model interview portion of the study.

1. Where would you go if you wanted to paint? (accept easel or tables)
2. Where would you go to wash your hands?
3. If there were doors in the model, where would one of them be?
4. Where would you go to play in the water?
5. Where would you go to read a book?
6. Where would you go to play with blocks?
7. Where would you go to play house?
8. When I make the TV for the model, where would we need to

put it?

9. Where would you go to go to the bathroom?

VII. Appendix B

A. Same-Different Interview Tasks

The following tasks were administered to the children for the purpose of evaluating their ability to make same and different distinctions and to verbalize the reasons for their choices. The tasks progressed in order from those involving a distinction based upon one attribute to those requiring a distinction based on one or more of several possible attributes. The sets of items used in the six tasks were:

1. crayons, two red and one green;
2. yogurt containers, two large and one small;
3. pictures, identical in shape, size and background color, two of identical butterflies and one of a paintbrush;
4. large foam shapes, one blue circle, one red circle, and one red circle with a hole in the center;
5. a knife, pen, and pencil;
6. bird pictures, identical in size and shape but with different background colors. One picture showed a white swan, one a white duck and one a dark colored rooster.

For each set of pictures or objects, children were asked:

1. If you had to pick two of these things that were the same, which two would you pick?
2. How are those two the same?
3. So this one would be different. Why would this one be

different?

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